

# Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain Tracts Recreational Residence Special Use Permit Re-Issuance Fisheries Biological Evaluation

**Zigzag Ranger District  
Mt. Hood National Forest  
Fifth Field Watershed: Zigzag River**

**Table 1.** List of Proposed, Endangered, Threatened, or Sensitive (PETS) Fish and Aquatic Mollusk Species found on the Mt. Hood National Forest and addressed under this Biological Evaluation:

	Date of Listing	Suitable Habitat Present	Species Present	Effects of Alternatives	
<b><u>Endangered Species Act Listing by ESU</u></b>				<b><i>No Action</i></b>	<b><i>Proposed Action</i></b>
<b><i>Threatened</i></b>					
<b>Lower Columbia River steelhead &amp; Critical Habitat</b> ( <i>Oncorhynchus mykiss</i> )	3/98 1/06	Yes	Yes	NLAA	NE
<b>Lower Columbia River chinook &amp; Critical Habitat</b> ( <i>Oncorhynchus tshawytscha</i> )	3/99 1/06	Yes	Yes	NLAA	NE
<b>Columbia River Bull Trout</b> ( <i>Salvelinus confluentus</i> )	6/98	Yes	No	NE	NE
<b>Middle Columbia River steelhead &amp; Critical Habitat</b> ( <i>Oncorhynchus mykiss</i> )	3/99 1/06	No	No	NE	NE
<b>Upper Willamette River chinook &amp; Critical Habitat</b> ( <i>Oncorhynchus tshawytscha</i> )	3/99 1/06	No	No	NE	NE
<b>Lower Columbia River coho</b> ( <i>Oncorhynchus kisutch</i> )	6/05	Yes	Yes	NLAA	NE
<b><u>Regional Forester's Sensitive Species List and Survey and Manage</u></b>					
<b>Interior Redband Trout *</b> ( <i>Oncorhynchus mykiss spp.</i> )	7/04	Yes	Unk	MIH	NI
<b>Columbia dusky snail (*, +)</b> ( <i>Lyogyrus n. sp. 1</i> )	7/04 1/01	Yes	Unk	MIH	NI
<b>Basalt Juga +</b> ( <i>Juga oreobasis n. sp. 2</i> )	01/01	No	No	NI	NI
<b><u>Magnuson-Stevens Fishery Conservation and Management Act</u></b>					
<b>Essential Fish Habitat</b>	1996	Yes	No	NAA	NAA

**Abbreviations/ Acronyms:**

Endangered Species Act Abbreviations/ Acronyms:		Essential Fish Habitat Abbreviations/ Acronyms:	
NE	No Effect	AE	Adverse Effect
NLAA	May Affect, Not Likely to Adversely Affect	NAA	Not Adversely Affected
LAA	May Affect, Likely to Adversely Affect		
Regional Forester's Sensitive Species List* and Survey and Manage+ Abbreviations/ Acronyms:			
Unk	Species presence unknown but suspected		
NI	No Impact		
MIH	May impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species		

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## Introduction

Forest management activities that may alter the aquatic habitat or affect individuals or populations of PETS (Proposed, Endangered, Threatened, and Sensitive) fish and aquatic species require a Biological Evaluation to be completed (FSM 2671.44 and FSM 2670.32) as part of the National Environmental Policy Act process and Endangered Species Act to determine their potential effects on sensitive, threatened or endangered species. The Biological Evaluation process (FSM 2672.43) is intended to conduct and document analyses necessary to ensure proposed management actions will not likely jeopardize the continued existence or cause adverse modification of habitat for:

- A. Species listed or proposed to be listed as endangered (E) or threatened (T) by the USDI-Fish and Wildlife Service or USDC-NOAA Fisheries, and their listed or proposed listed critical habitat.

The Biological Evaluation process (FSM 2672.41) is also intended to conduct and document analyses to ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or contribute to animal species or trends toward Federal listing of any species for:

- B. Species listed as sensitive (S) by USDA-Forest Service Region 6.

The Mt. Hood National Forest (MHNH) currently has 554 recreational residences located on the Zigzag Ranger District (ZZRD). These are privately owned non-permanent structures located on National Forest System Lands. For management purposes, the 554 residences have been aggregated into ten tracts. The number of recreational residences in each tract range in number from 7 to 158. Each permittee has been issued a Special Use Permit allowing their privately owned structure(s) to occupy Forest Service lands. This provides a unique Forest-based recreational opportunity. The current special use permits, issued for a 20-year period, will expire on December 31, 2008.

This Biological Evaluation (BE) analyzes impacts associated with the proposed action of re-issuance of a Special Use Permit for up to 20 years to each of the 478 recreational residences in five tracts located on the Zigzag Ranger District, Mt. Hood National Forest. These tracts include: Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain. The legal description is T 03S, R 07E, Sections 2, 3, 11, 12, 13, 14 and 24 W.M. and T03S, R 08E, Sections 16, 17, 18 and 19 W.M.

## History and General Description of Recreational Residence

The recreation residence program began in 1915 on the Mt. Hood National Forest. Tracts were platted up to the early 1960's, ending with 10 tracts all located on the Zigzag Ranger District. The goal of the program was to encourage recreational use of the newly created National Forest System lands. The 1990 Mt. Hood National Forest Land and Resource Management Plan (LRMP) deemed this is a valid use of USFS lands and has given specific direction to their management through Developed Recreation (A10) Land Allocation with the goal to, *"Provide a range of high quality outdoor recreational opportunities for concentrated recreational use at readily accessible, appropriately designed developed sites"* with specific Standards and Guidelines for their management (USDA, 1990).

Typically, each lot is approximately 0.25 to 0.5 acres in size. Lot size may vary in position, local topography or proximity to other lots. Most recreational residences receive their water from one of

two domestic water systems. The exceptions are lots 101 to 167 of the Cool Creek tract, which receives domestic water from pumps or by carrying-in practices. Recreational residence can be up to 1200 square feet in size with a maximum height of 26 feet with one additional structure and an outhouse. Other authorized improvements are variable from permit to permit but could include a driveway, culverts, waterlines, single tread trail, footbridges and parking for up to 2 vehicles. As part of their permits, natural vegetation composition and structure are to be maintained on each lot. Most lots are occupied by mid-seral stands of Douglas-fir and western red cedar with small patches of remnant old growth sized trees. Cabins must be occupied for at least 15 days per year but shall not be used as a full time residence to the exclusion of a home elsewhere. Average use of each cabin is about three or four weeks per year while the remainder of the calendar year cabins are vacant.

Each recreational residence has a septic system. Septic systems vary from an outhouse, cesspool, sand filter, pressure distribution and standard systems with drain fields. As part of permit issuance, all permittee's will need to have a Clackamas County certified inspection on file, completed since 2002. Each inspection will document if the system is functioning to the standard of the date of installation. If not, the permittee is required to upgrade to meet current county codes and standards. If upon inspection it is found only the tank has failed, current county standards require installation of a new 1000-gallon tank. If the entire system has failed a new system is required that includes installation of two tanks (1000-gallons each) and a modern drain field or sand filter system. Clackamas County set backs for new septic tanks or systems is 100 feet from surface waters. As with any modifications to structures or lots covered in the Recreational Residence Special Use Permits, site-specific analysis is completed and BE's are written analyzing possible environmental effects is part of the USFS approval process. If at the time of issuance of a new Special Use Permit, December 31, 2008, a current septic inspection is not on file a one-year conditional permit will be issued at which time an inspection will need to be completed. If one is not forthcoming then the permit will expire. Since 2003, there has been an increase in the number of new septic systems being installed yearly in light of this direction.

## **Project Area**

The project area includes 478 recreational residence lots in the five tracts, totaling approximately 239 acres. All of these lots are located in the Zigzag River Watershed, a 5<sup>th</sup> field tributary in the upper Sandy River Basin. The Zigzag River drains the west and southwest sides of Mt. Hood in northwestern Oregon. The project area is approximately 45 miles east of Portland. Access to the area is via U.S. Highway 26 and Forest Service roads 2609, 2610, 2612, 2613, 2614, 2615, 2628, 2629, 2630 and 2635.

The Zigzag River watershed is approximately 37,730 acres in size and is segmented by four stream systems: Still Creek, Camp Creek, Henry Creek (all tributaries to the Zigzag River) and the Zigzag River. The Zigzag River originates from the Zigzag Glacier, carves its way through volcanic debris flow in the upper watershed, and then travels westerly through central portions of the watershed's volcanic debris, terminating in alluvium near its confluence with the Sandy River (USDA, 1995). Still Creek originates from Palmer Glacier and a series of springs on Mt. Hood's west side. Camp Creek originates from a series of springs and wetlands above the town of Government Camp. Henry Creek is formed from a series of springs and snowmelt off of Zigzag Mountain (USDA, 1995). In the spring, the Zigzag River becomes turbid from glacial melt water while Still Creek, Henry Creek and Camp Creek remain clear-water tributaries. The Zigzag River clears up once the Zigzag Glacier begins to freeze during fall storms.

The elevation of the Zigzag River watershed ranges from 1,400 to 10,000 feet (USDA, 1995). Annual precipitation ranges from 130 inches at its highest elevation to 65 inches in the upper Still Creek drainage. The landforms and soils within the watershed are formed on relatively young geologic surfaces. The geology of the toeslopes and sideslopes of the watershed's western portion consists of weak rocks that originated from volcanic debris flows. On the ridges above these slopes, more resistant volcanic flow rock caps the weaker material (USDA, 1995).

Three main vegetation zones occur within the watershed: Western Hemlock, Pacific Silver Fir and Mountain Hemlock, typical of those forest types west of the Cascade Crest. The watershed's current vegetative conditions are mainly even-aged, moderately dense stocked 80 to 100 year-old Douglas-fir and western hemlock dominated stands (USDA, 1995). Approximately 85 percent of the watershed is in mid-seral and 7 percent is in late-seral stand conditions. This is mostly due to several large fires that burned over the watershed from 1917 to 1952 (USDA, 1995).

European-Americans moved into the Zigzag watershed in the mid 1800's via the Barlow Road. Today, several small towns are present along U.S. Highway 26, the original travel route. These include Government Camp, Rhododendron and Zigzag. Land ownership in the Zigzag River Watershed is approximately 97 percent Forest Service and 3 percent private.

The Mile Bridge tract consists of 158 residences located along the lower portions of the north and south sides of the Zigzag River (Map 3 and 4). They are located on the first terrace above the bankfull channel elevation at a slope distance of 20 to 200 feet from the ordinary high water mark.

The Still Creek tract consists of 57 residences located along the lower portions of Still Creek and the confluence of the Zigzag River (Map 5). They are located on the first or second terrace above the bankfull channel elevation at a slope distance of 25 to greater than 300 feet from the ordinary high water mark.

The Vine Maple tract consists of 85 residences located along the north and south sides of Still Creek (Map 6). They are located on the first or second terrace above the bankfull channel elevation at a slope distance of 25 to greater than 175 feet from the ordinary high water mark.

The Camp Creek tract consists of 138 residences located along the north and south side of lower Camp Creek near the confluence with the Zigzag River (Map 7 and 8). They are located on the first or second terrace or upland benches above the bankfull channel elevation at a slope distance of 20 to greater than 400 feet from the ordinary high water mark.

The Flag Mountain tract consists of 40 residences located along Zigzag River (Map 9). They are located on the first or second terrace or upland benches above the bankfull channel elevation at a slope distance of 40 to greater than 300 feet from the ordinary high water mark.

## Action Area and Baseline Conditions

The Action Area includes the Project Area (each of the 478 lots) and downstream segments of each stream or river to account for potential impacts to sediment load and water quality. Within the Zigzag Watershed, the Action Area begins at RM 4.8 on the Zigzag River, RM 1.9 on Still Creek, RM 3.1 on Camp Creek and extends downstream to RM 1.9, 0.0 and 0.0, respectively. Following is a description of baseline conditions within the Action Area.

### Zigzag River

The Zigzag River has been segmented into four geomorphically unique reaches. The two Recreational Residence tracts (Mile Bridge and Flag Mountain) are located in reaches one and two of the Zigzag River (Map 2). Reach 1 ranges from RM 0.0 to RM 2.2. Reach 2 ranges from RM 2.2 to 7.3. Reach 1 is slightly entrenched with an average gradient of 2 to 3 percent. According to the Zigzag Watershed Analysis (USDA, 1995), the dominant channel substrate is cobble and small boulder. The bankfull channel width is 60 to 70 feet. The flow regime is a combination of glacial runoff and spring fed systems as it mixes with water from Still Creek. Salmonid habitat is dominated by moderately steep riffles with lateral and pocket pools associated with boulders and large woody debris (LWD). The lower 1.5 miles of Reach 1 has three to four side channels and off-channel habitats providing juvenile rearing conditions as well as an increase in the number of pools greater than three feet deep. The 1991 stream survey noted low amounts of LWD in all reaches of the Zigzag River. Likely reasons include past stream clean out activities that preceded the 1964 flood, past fire history and moderately steep, high-energy character of the channel that likely moves most LWD episodically (Sandy River Basin EDT, 1999). Most of the riparian stands along the Zigzag River are fully stocked, with a multi-layered canopy of Douglas-fir, Western Redcedar and western hemlock.

Reach 2 is moderately entrenched as it cuts through old mudflow deposits of sand, boulder and small cobble providing little to no side channel or off channel habitat for salmonid rearing. Dominant channel substrate is cobble and small boulder. Average channel gradient is 4% with a bankfull width of 50 to 60 feet. The flow regime is similar to glacial runoff systems with turbid low-flows and generally buffered peak flows with occasional outburst floods and infrequent rain-on-snow events (USDA, 1995).

### Still Creek

Still Creek is segmented into 5 geomorphically unique stream reaches. Still Creek and Vine Maple tracts are located in reaches 2 and 3 of Still Creek (Map 5 and 6). Reach 1 begins at RM 0.0 and extends to RM 1.0. Reach 2 begins at RM 1.0 and extends to RM 3.2, Reach 3 begins at RM 3.2 and ends at RM 7.3. Reach 1 is moderately entrenched with an average gradient of 2.5 percent. The dominant channel substrate is small boulder and cobble. The bankfull channel width is 59 to 65 feet. The 1996 stream survey noted small amounts (1.1 pieces per mile) of LWD, largely from stream restoration actions completed during 1982 and 1983 and again in 1996. Though flow in Still Creek originates from Palmer Glacier, its flow regime is heavily influenced by the numerous small tributaries located upstream. Consequently, the flow regime is more stable similar to a spring fed system and minimally turbid.

Reach 2 is slightly entrenched being well connected to its flood plain. Dominant channel substrate is gravel and small cobble. Average channel gradient is 1.5 percent with a bankfull width of 44 to 46 feet. The flow regime is similar to that of reach 1. The 1996 Still Creek Stream Survey noted 15.8 pieces of medium and large sized wood in channel.

Reach 3 is slightly entrenched being well connected to its flood plain. Dominant channel substrate is gravel and small cobble. Average channel gradient is 3.0 percent with a bankfull width of 44 to 46 feet. The flow regime is similar to reach 1. The 1996 Still Creek Stream Survey noted small amounts of medium and large sized wood in the channel.

#### Camp Creek

Camp Creek is a tributary to the Zigzag River, entering at RM 3.7 (USDA, 1994). It is segmented into 3 geomorphic reaches. Reach 1 (RM 0 to 0.4) and Reach 2 (RM 0.4 to 4.0) and includes portions of the Camp Creek tract. Reach 1 is slightly entrenched as it meanders across the flood plain and terrace of the Zigzag River. Dominant channel substrate is gravel with an average channel gradient of 5.0 percent. Bankfull channel width is approximately 29 feet. The flow regime is similar to that of a snowmelt and spring fed system. The 1994 stream survey noted low amounts of LWD (Sandy River Basin EDT, 1999). Yokum Falls, located at RM 5.75 is a full fish-passage barrier. Camp Creek has been documented as having high amounts of fine sediment from road sanding (USDA, 1995).

Reach 2 is moderately entrenched, cutting through old mudflow deposits of boulder, cobble and sand. Dominant channel substrate is cobble and small bolder with an average gradient of 4.0 percent. Bankfull channel width is apporoximately 30.0 feet. The flow regime and amounts of in channel LWD is the same as Reach 1.

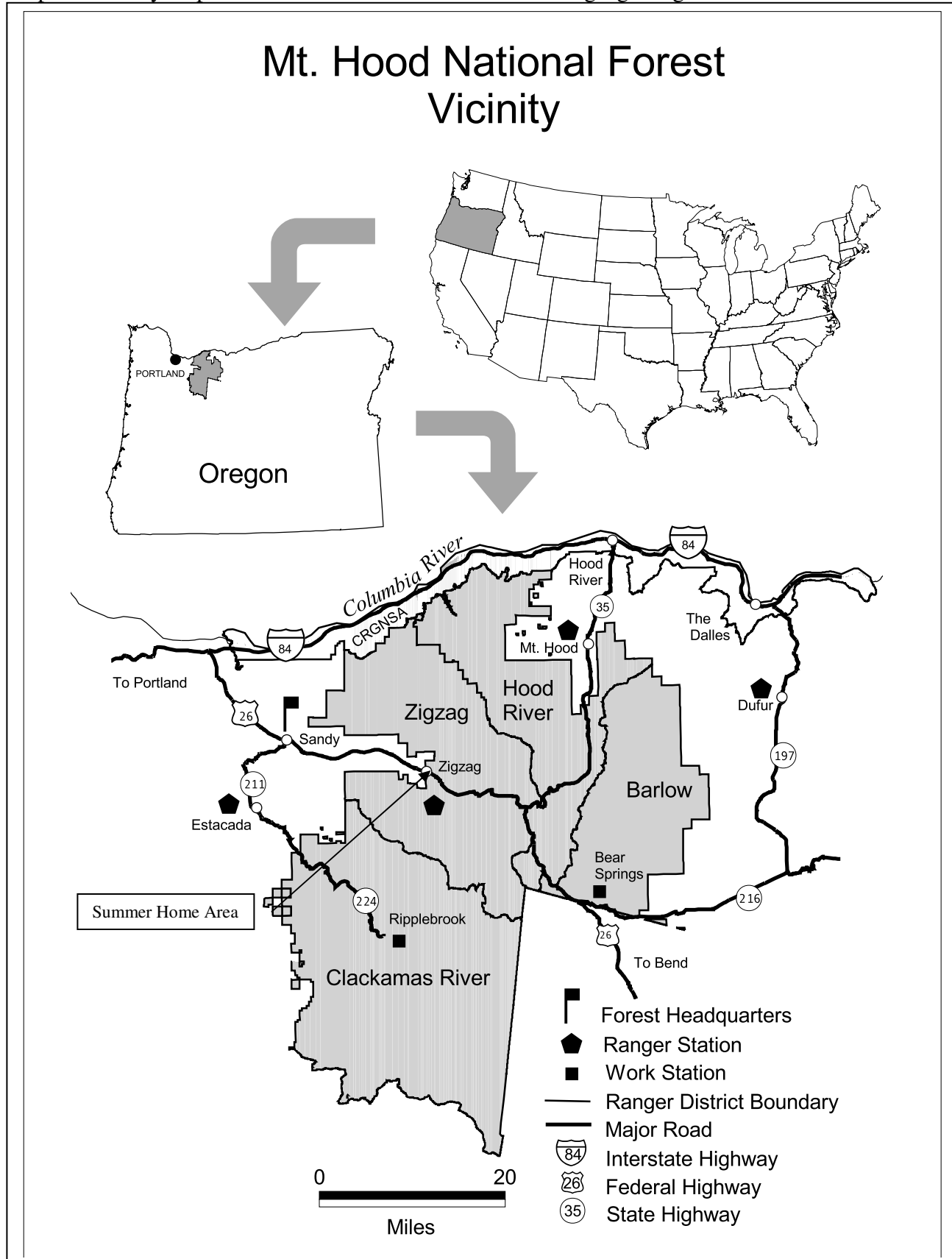
#### Water Quality

Water quality related to Recreation Residences Septic Systems was a key question during the Zigzag Watershed Analysis. Based on macroinvertebrate sampling as well as water quality samples taken, no adverse effects were detected (USDA, 1995). Other parameters that were investigated include stream temperature and sediment and turbidity. Findings showed that riparian canopy closure was greater than or equal to 70% for more than 80% of the stands in the Recreational Residence tracts and that stream temperature was not an issue of concern (USDA, 1995). There were high amounts of turbidity noted, mainly due to the glacial nature of the watershed. Sediment levels above background were mainly due to highway sanding and roads (USDA, 1995). There were no correlations made that Recreational Residence were responsible for elevated sediment levels. The 1990 Zigzag River Stream survey noted excessive user trails near streams and through riparian areas near recreational residence tracts on the Zigzag River (USDA, 1990).

#### Invasive weeds

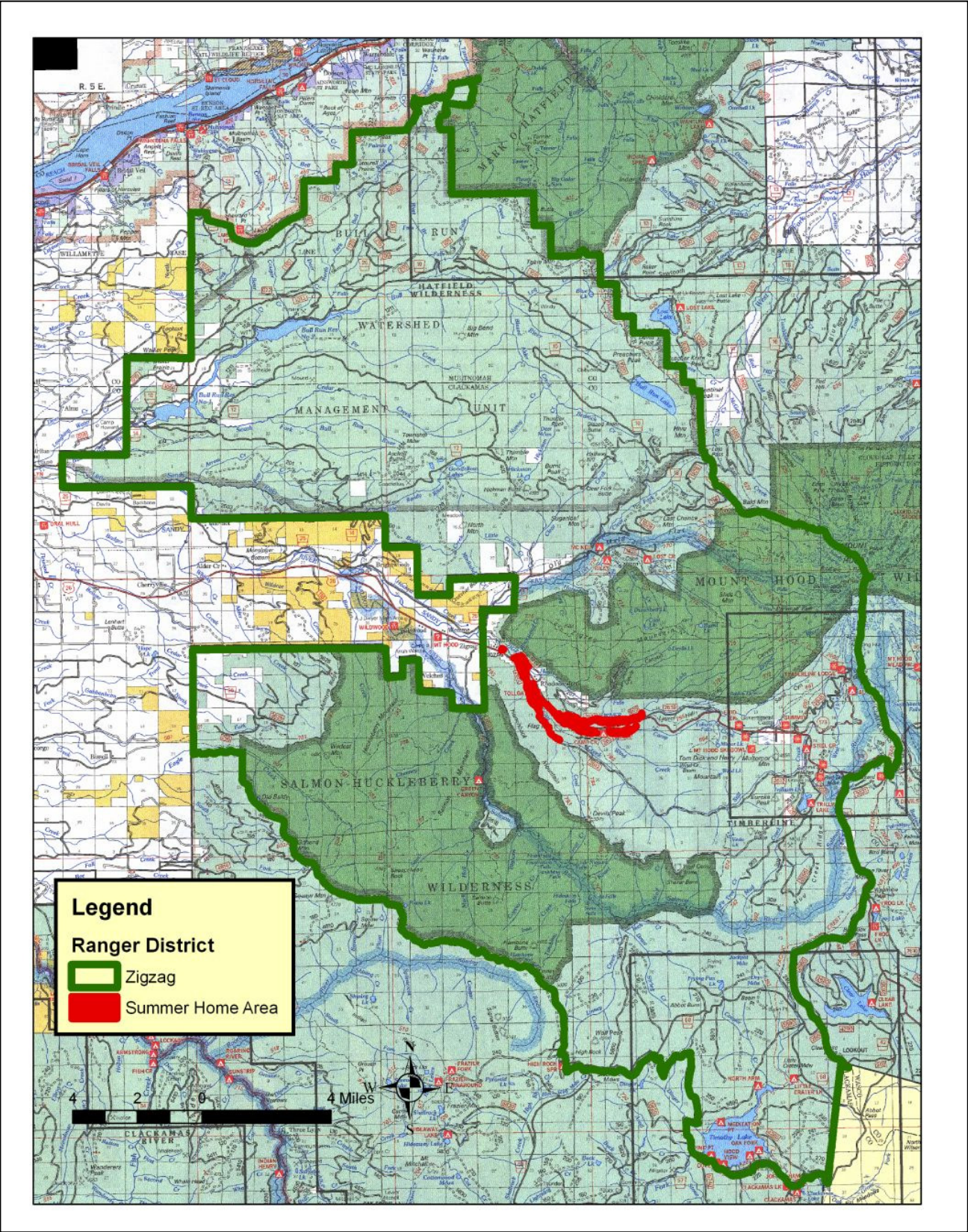
Recent surveys completed in 2004 and 2005, documented invasive weeds such as knotweed, scotch broom, vinka and periwinkle occurring in small patches, usually 100 sq. feet or less, sporadically throughout summer home areas (USFS, 2005). The Action Area has also been analyzed and is included in the Draft Final Environmental Impact Statement for Site-Specific Invasive Plant Treatments for the Mt. Hood National Forest and Columbia River Gorge National Scenic Area in Oregon, Including Forest Plan Amendment Number 16 (USDA, 2007).

Map 1. Vicinity map of the Mt. Hood National Forest and Zigzag Ranger District.



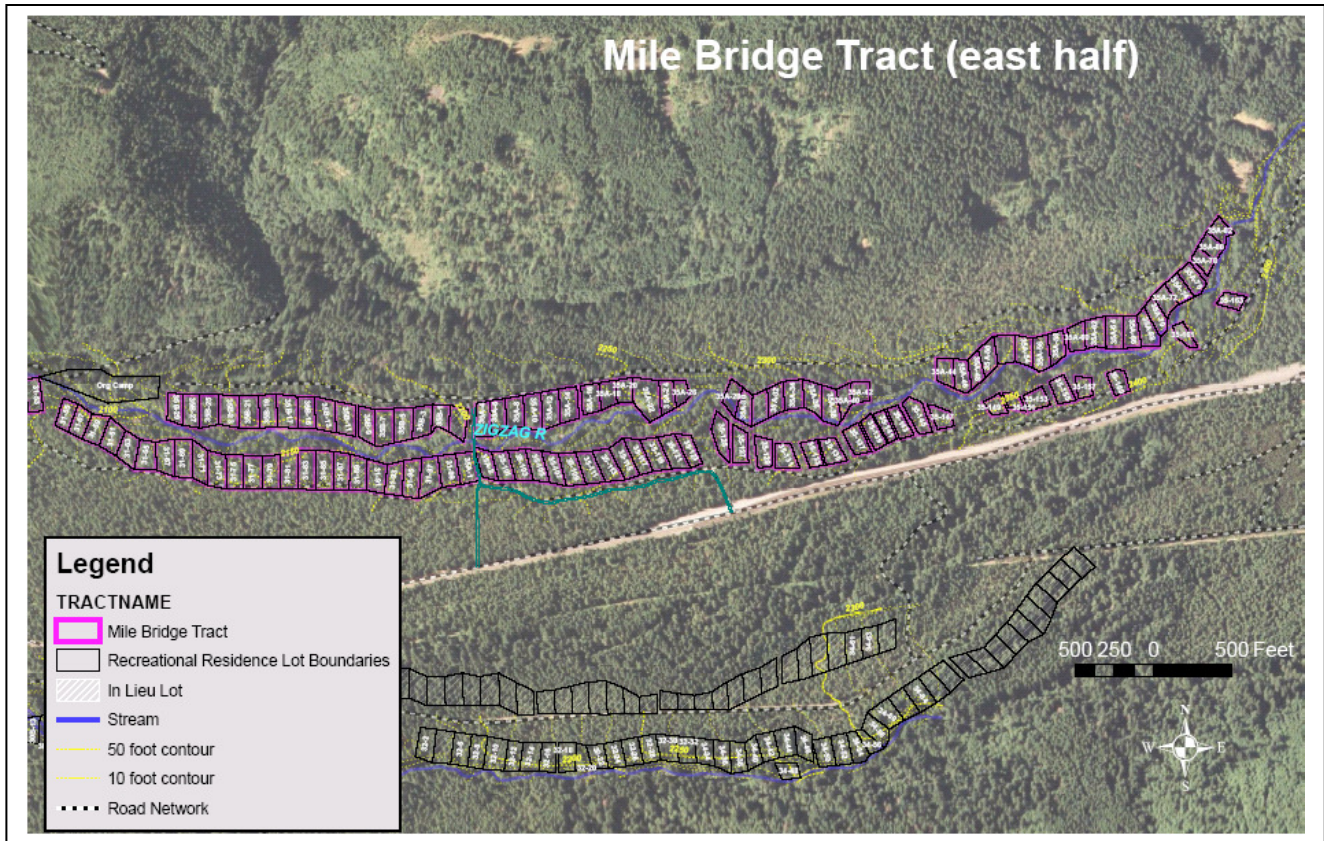


Map 2. Vicinity map of the Zigzag River Watershed with the recreational residence tracts highlighted.

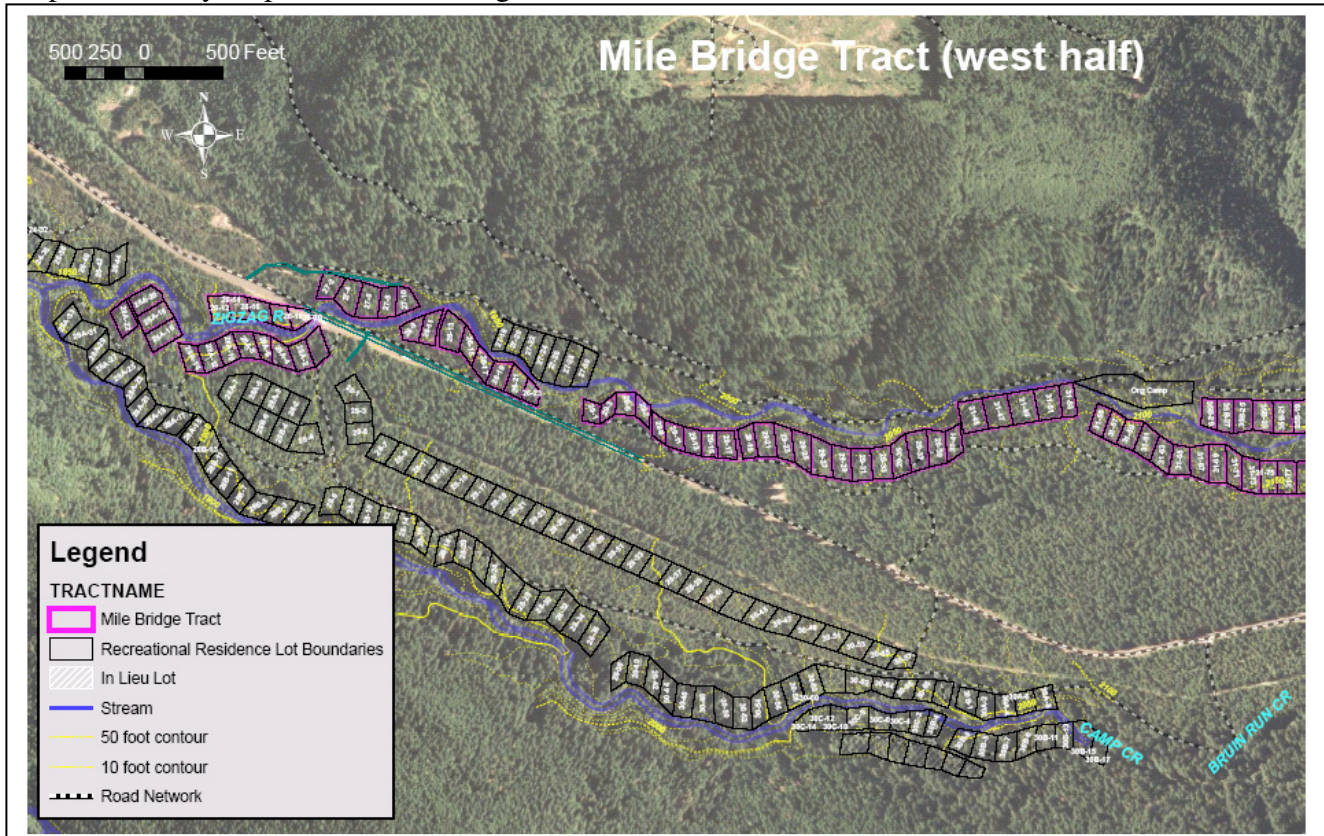




Map 3. Vicinity map of the Mile Bridge recreational residence tract, east half.

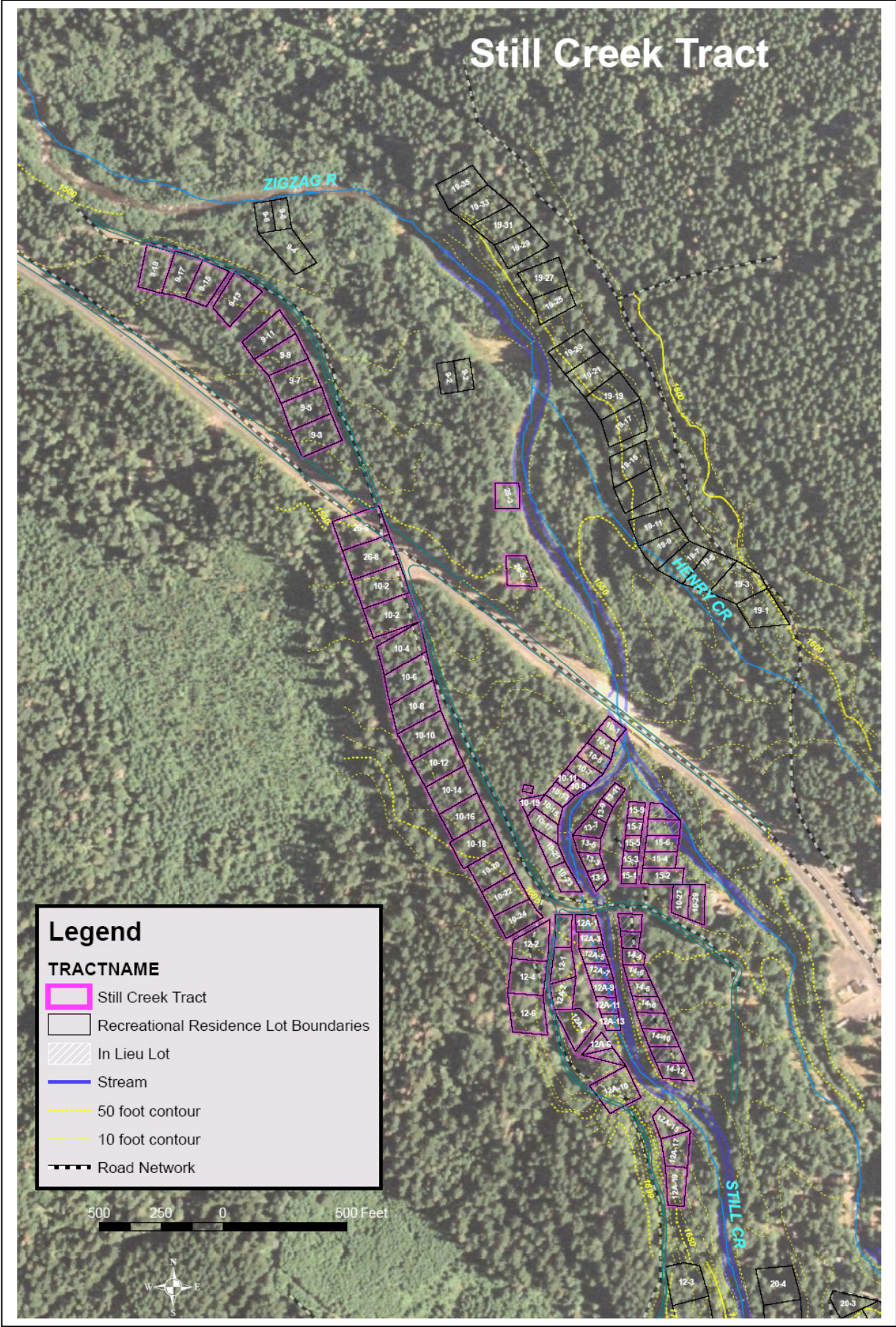


Map 4. Vicinity map of the Mile Bridge recreational residence tract, west half.



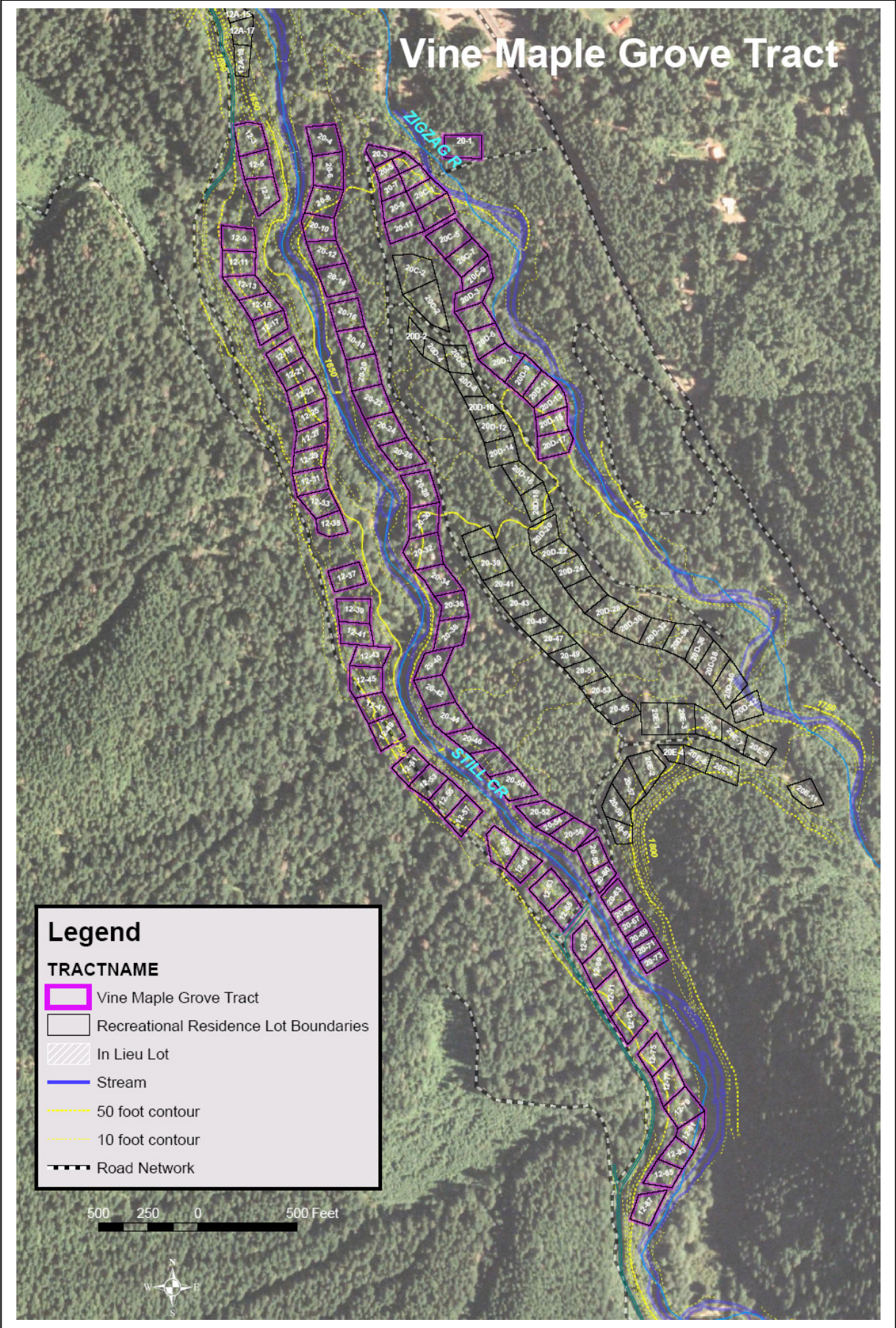


Map 5. Vicinity map of the Still Creek recreational residence tract.



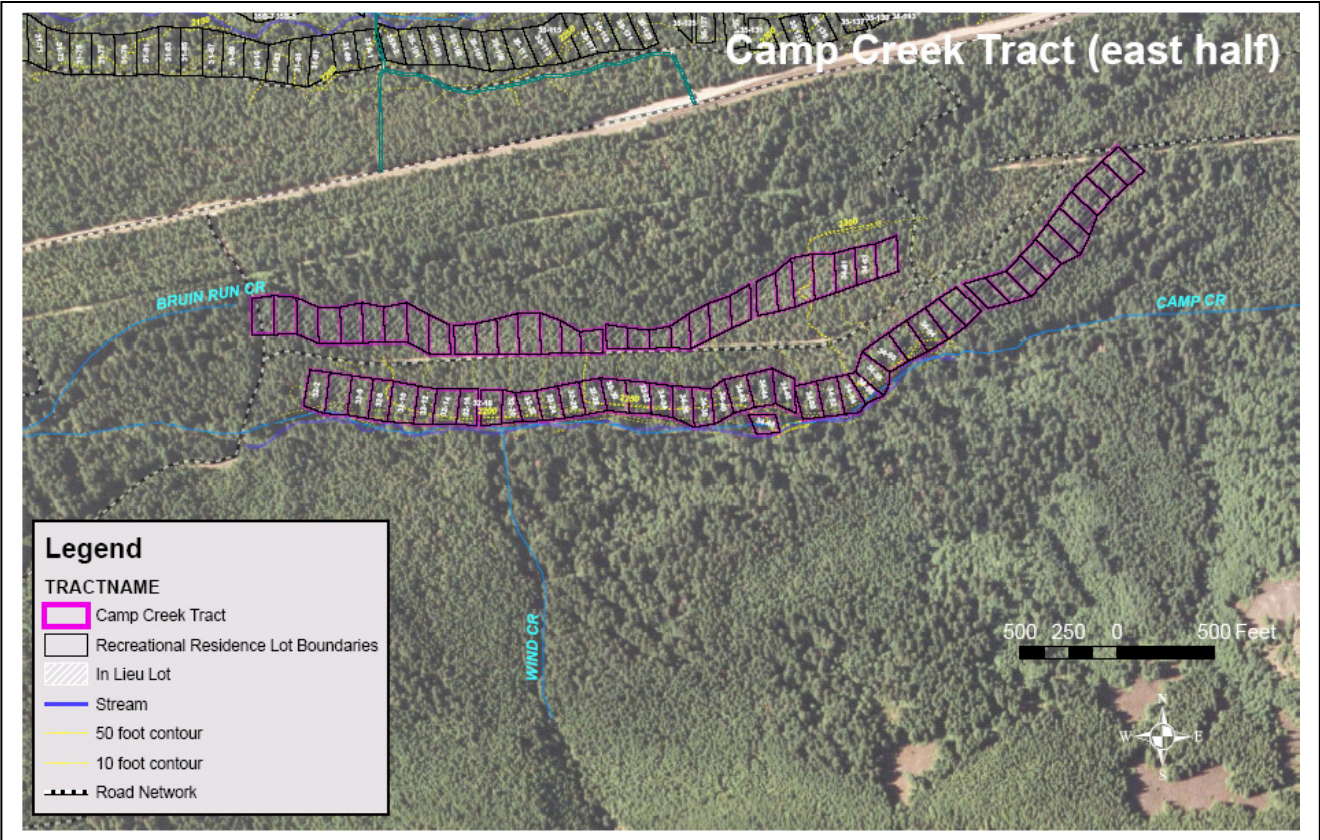


Map 6. Vicinity map of the Vine Maple recreational residence tract.

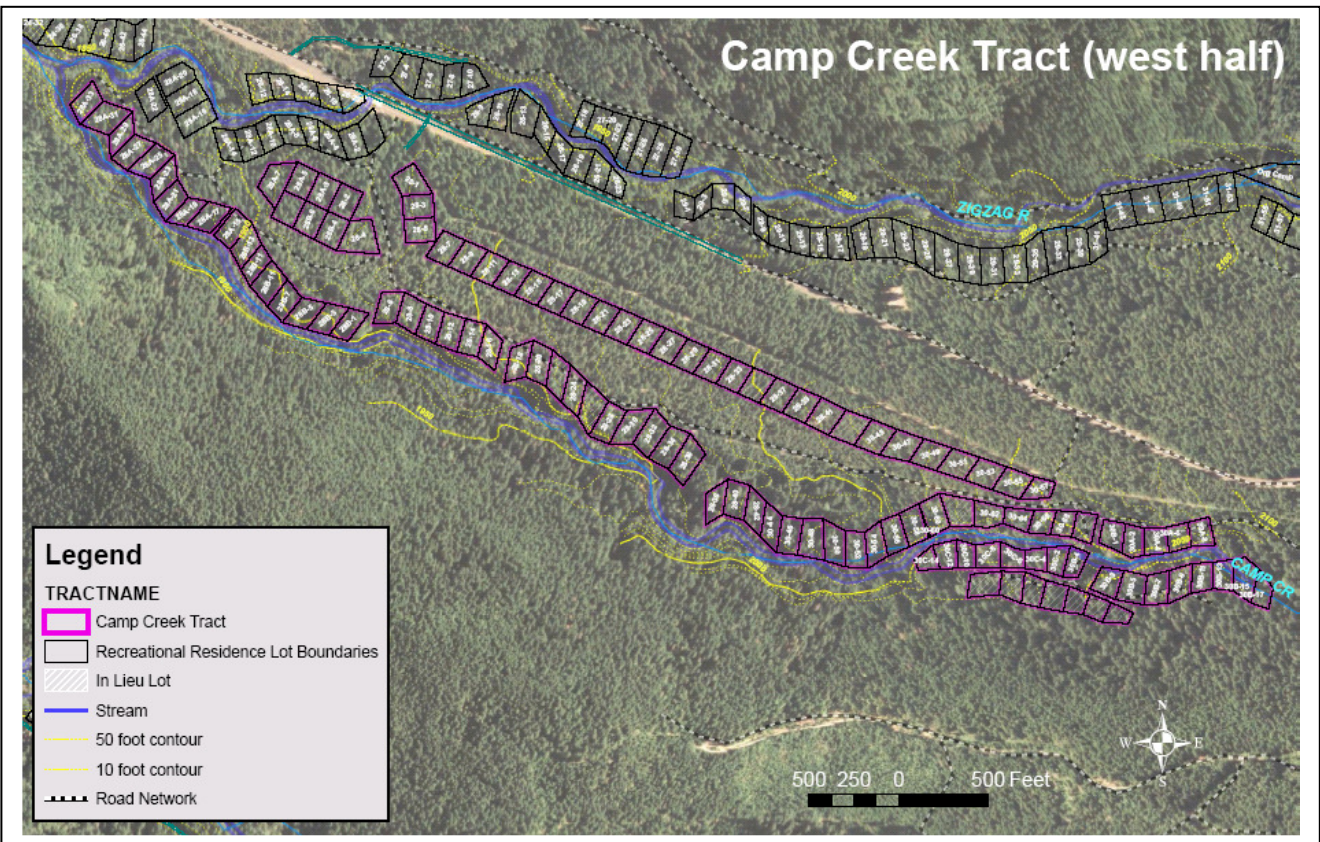




Map 7. Vicinity map of the Camp Creek recreational residence tract, east half.

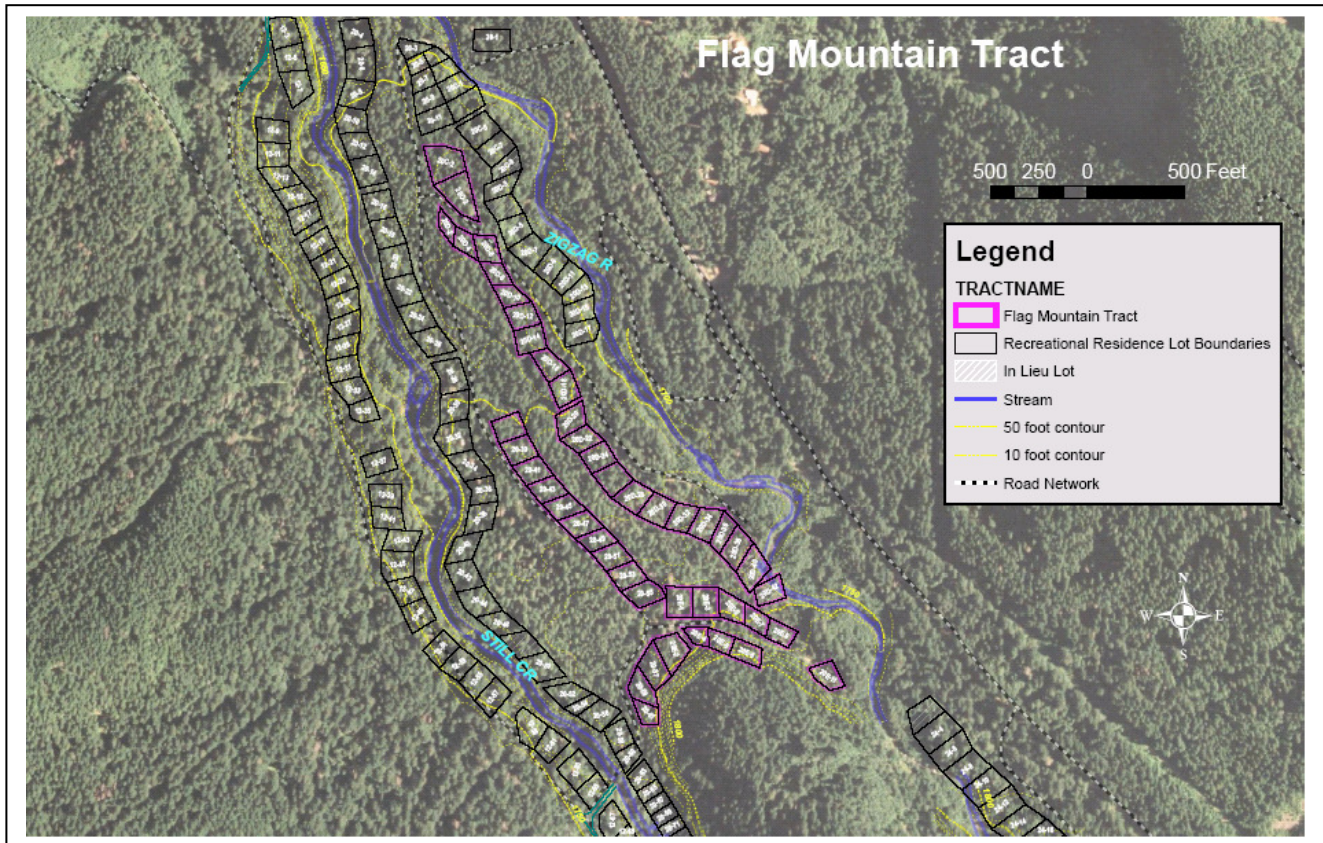


Map 8. Vicinity map of the Camp Creek recreational residence tract, west half.





Map 9. Vicinity map of the Flag Mountain recreational residence tract.



## Description of Alternatives

### No Action Alternative

The Forest Service will allow the 478-recreation residence current permits to expire and the current use would not continue. There would likely be up to a 10-year grace period for the permittee's to remove all structures from the landscape. Restoration of each lot with revegetation with native plants and trees would be required as well as removal of all septic systems and structures. Modification to the LRMP and the A10 land allocation may follow these actions during future review scheduled in 2010.

### Proposed Action Alternative

The Proposed Action would authorize continued recreation residence use on Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain tracts for up to a 20-year period beginning January 1, 2009. As part of the proposed action there are provisions requiring permit holders to mitigate negative resource impacts identified in Appendix A, Table 1. District resource specialist identified these compliance issues during field surveys from June 28, 2005 to April 19, 2007. Once these corrective measures are implemented and inspected, permittees will be compliant with the terms and conditions of their permit.

## **Design Criteria**

Because the Proposed Action is to re-issue special use permits to each of the 478 permittee's, no new ground disturbing activity will occur (with the exception of approved corrective measures in Appendix A, Table 1. Any new or additional activities will be analyzed in a separate Categorical Exclusion (CE) or Environmental Assessment (EA) with BE's from Fisheries, Wildlife and Botany as well as a Heritage and Hydrologist resource reports. Site-specific Design Criteria will be prescribed at that time.

## **Interrelated or Interdependent Actions**

Secondary impacts include interrelated projects that have no independent utility apart from the proposed action, and interdependent projects that are a part of a larger action and depend on the larger action for justification.

There are no interrelated or interdependent actions for the proposed action or no action alternative.

## **Presence of PETS Fish and/or Aquatic Species**

The Zigzag River watershed supports several species of anadromous and resident fishes. Anadromous fish have volitional access in the Zigzag River from the confluence with the Sandy River to a set of barrier falls at RM 13.2. However, given the normal turbidity present in the Zigzag River it is believed that anadromous fish rarely venture above RM 8 or 9 (USDA, 1995). Anadromous fish have volitional access in Still Creek from its confluence with the Zigzag River to a set of barrier falls that occur between RM 11.2 to 11.8. Anadromous fish have volitional access in Camp Creek from its confluence with the Zigzag River to Yokum Falls located at RM 5.75. The only known barrier to fish passage from the project area to the Pacific Ocean is Marmot Dam, located at RM 30.0 on the middle Sandy River. Information for this chapter of the document came from several sources that include:

- Zigzag River Watershed Analysis, 1995.
- Zigzag River Watershed Analysis Update, 2004.
- ODFW and USFS Chinook and Coho Salmon Spawning Surveys 1998 - 2006.
- Still Creek Smolt Trap data, 1990 - 2006.
- Sandy River Basin Anchor Habitat Report, 2004.
- Sandy River Basin Characterization Report, 2005.
- Sandy River Basin Ecosystem Diagnosis and Treatment model, 1999.
- Final EIS, Bull Run Project, FERC Project No. 477-024, 2003.

Other fish species known to be present in the Zigzag River watershed are longnose dace, mountain whitefish, lamprey, and torrent and shortnose sculpin but complete distribution information on these species is lacking. Following is a more in-depth discussion of PETS aquatic species.

## **Federally Listed Species by NOAA Fisheries and USFWS**

### **Columbia River Bull Trout (*Salvelinus confluentus*) Threatened**

Bull trout are believed to be a glacial relict whose distribution has expanded and contracted with natural climate changes. Bull trout often occur upstream from barriers in many drainages, an indication of early colonization.

Bull trout live in a variety of habitats including small streams, large rivers, and lakes or reservoirs. In some drainages, the fish spend their lives in cold headwater streams. The Oregon Department of Fish and Wildlife (ODFW, 1997) has no historic documentation or evidence of bull trout in the Sandy River basin. In the past few years two bull trout have been documented in the lower Sandy River. In 2000, the ODFW fish survey crews identified an 18-inch bull trout caught in the trap at Marmot Dam, over 14 miles downstream. The other fish was caught and released by an angler in the lower Sandy River below Oxbow Park. These are believed to be strays from the populations in Washington State (Muck, 2001).

Based on lack of historical evidence of Bull trout presence in the upper Sandy River basin, and lack of sightings by survey crews, Bull trout are not expected to be present within the project area. They will not be further discussed.

### **Lower Columbia River Steelhead (*Oncorhynchus mykiss*) Threatened**

Within the Sandy River basin, every passable reach contains winter steelhead spawning or rearing habitat. In the upper basin, good winter steelhead production exists in the Salmon River system below Final Falls, in Still Creek and many small upper basin tributaries (OT, 2004). Production also occurs in turbid stream reaches such as the Muddy Fork of the Sandy River, the upper Sandy River and the Zigzag River where glacial flour is evident.

Wild winter steelhead in the Sandy River are widely distributed, and spawn and rear in many tributaries and mainstem reaches throughout the sub-basin. Historically, wild winter steelhead typically migrated past Marmot Dam after late February with the majority of the fish passing the dam in April and May.

Spawning of wild winter steelhead generally occurs from April to June. Adults usually spawn in second to fourth order tributaries, and often higher in respective drainages than either coho or chinook. Wild winter steelhead smolts migrate downstream to the ocean typically as age 2+ smolts in spring, but 3+ smolts are not uncommon.

Typically, winter steelhead smolts depart natal tributary streams and enter the Columbia River in late spring or early summer, and then descend to the ocean. Winter steelhead in the Sandy River usually spend two summers in the ocean before returning to spawn. Age at return is variable both between and within brood years.

Documented presence of LCR steelhead is to RM 7.3 to 8.0 in the Zigzag River, RM 11.2 to 11.8 in Still Creek and RM 5.75 in Camp Creek (ODFW, 1997 and USFS, 2001). The upper boundary of the Action Area is adjacent to RM 4.8 on the Zigzag River, to RM 1.8 on Still Creek and RM 3.1 on Camp Creek. Therefore, LCR steelhead occur within and downstream of the Action Area.



## Lower Columbia River Chinook (*Oncorhynchus tshawytscha*) **Threatened**

Chinook salmon in the Sandy River basin separated into two run times: fall and spring. Fall chinook are indigenous to the Sandy River. The ODFW presently describes two components of this fall running fish: early maturing tule, and later maturing Sandy stock fall chinook that is the dominant fall chinook stock in the sub-basin.

### Fall Chinook Salmon

Early maturing tule fall chinooks enter the Columbia River as early as July and enter the Sandy River in August. Tule fall chinooks generally spawn from late September to mid-October. Distribution in the basin is limited by low flow conditions typical of the Sandy River at this time. Peak spawning usually occurs in early November

Spawning generally occurs in the mainstem from Lewis and Clark State Park to the upstream boundary of Oxbow Park, at least 26 miles downstream from the project area. Spawning activity is usually highest near Oxbow Park where there are large deep resting pools and wide gravel bars.

Though the bulk of spawning for fall chinook presently occurs in the mainstem and tributaries of the lower basin near Oxbow Park, historical spawning distribution is documented to have occurred in the Bull Run River, Gordon and Trout Creeks and in large tributary streams above Marmot Dam.

USFS and the Bureau of Land Management (BLM) surveyors observed chinook spawning activity in Sixes Creek, a tributary to the lower Salmon River, in early November of 1994 and 1995. These observations occurred several weeks after spring chinook spawning activities in the area ended, and scale samples taken in 1994 showed distinct fall chinook patterns (Taylor, 1998). Also, some chinook migrating over Marmot Dam in October and November have shown morphological similarities to fall chinook according to pictures taken at the counting facility (Taylor, 1998).

### Spring Chinook Salmon

Most naturally producing Sandy River spring chinook spawn in the upper watershed above Marmot Dam. Primary spawning areas include the Salmon River, Still Creek, Zigzag River and the upper Sandy River and the lower reaches of several tributaries when flows permit. Generally, chinook salmon prefer large pools in low gradient areas within the mainstem and large tributaries. They are not usually found in smaller tributaries or side channels (ODFW, 1997).

Spring chinook may enter the Sandy River as early as February, but peak movement into the subbasin typically occurs in April and May. Spring chinook typically migrate into the upper subbasin above Marmot Dam from May to early October; however, some migrants are observed as early as April and as late as November.

Spring chinook returning to the Sandy River typically spawn from August to early October, and spawning activity is generally complete by mid-October based on spawning ground surveys conducted by the USFS in Still Creek and Salmon River (USDA, 1996).

Naturally produced juvenile spring chinook typically outmigrate to the Columbia River in the spring of their second year as yearling (1+) smolts. Some juvenile spring chinook may outmigrate in the fall as sub-yearlings, however; information on size at outmigration for naturally produced spring chinook in the subbasin is limited.

Documented presence of LCR spring chinook is to the lower 3.7 miles in the Zigzag River, to RM 3.3 in Still Creek and to RM 5.75 in Camp Creek (ODFW, 1997 and USFS, 2001). The upper boundary of the Action Area is adjacent to RM 3.8 on the Zigzag River, to RM 1.8 on Still Creek and RM 3.1 on Camp Creek. Therefore, LCR spring chinook occur within and downstream of the Action Area.

#### Lower Columbia River/SW Washington Coho Salmon (*Oncorhynchus kisutch*) **Threatened**

The Sandy River Basin supports two coho stocks: a native late-spawning stock (November-February) and an early-spawning hatchery stock (September-November). The basin's native coho population generally spawns and rears in the clear-water tributaries above Marmot Dam, though some production also occurs in the lower basin.

Studies show that coho salmon prefer areas with low water velocities, such as low gradient small and medium-sized streams, side channels and the margins of mainstem rivers (ODFW, 1997). Primary habitat exists in the Salmon River and tributaries below Final Falls, Horseshoe Creek, Clear Fork of the Sandy, Lost Creek and Still Creek. The mainstem Sandy River and side channels also support some coho production (ODFW, 1997).

Most coho pass above Marmot Dam in September and October with most spawning occurring in late October through November. Though natural reproduction continues to occur in the lower subbasin below Marmot Dam, primary spawning and rearing areas are currently located in the clear-water tributaries above Marmot Dam, primarily in the Salmon River and its tributaries below Final Falls, upper Sandy River tributaries and in Still Creek.

Emergence from the gravels takes place February to April. Winter water temperatures vary at different elevations in the basin and are generally cooler in headwater areas. Thus, incubation timing of eggs in redds in lower elevation tributaries may develop faster than eggs developing in redds at higher elevations. Later returning coho bound for the upper subbasin may encounter colder water temperatures than earlier migrating fish. Emergent coho fry have been identified at Marmot Dam as late as June 1.

Juvenile coho typically migrate from the Sandy River at about 12 to 14 months of age, and are referred to as age 1+ smolts. Actual time and size of ocean entry for naturally produced Sandy stock coho is unknown.

LCR coho salmon have been documented in the Zigzag River up to RM 7.3 to 8.0 to RM 11.2 to 11.8 in Still Creek and to RM 5.75 in Camp Creek (ODFW, 1997 and OT, 2004). The upper boundary of the Action Area is adjacent to RM 4.8 on the Zigzag River, RM 1.8 on Still Creek and 3.1 on Camp Creek. Therefore, LCR coho salmon occur within and downstream of the Action Areas adjacent to the Zigzag River and Henry Creek.

## Regional Foresters Sensitive Species List

### Interior Redband Trout (*Oncorhynchus mykiss* spp.)

Redband trout are a native trout of western North America. There is considerable variation in the life history in this group of trout. Resident stream populations are found throughout the Columbia River Basin.

Redband trout are typically a stream-resident fish that make short spawning migrations either in the same stream or often into smaller tributaries. Redband trout prefer cool, clean, relatively low gradient streams but, in some circumstances, are able to withstand wider temperature variations than their cousins the westslope cutthroat trout.

Redband trout are known to occur in sympatry with both resident and anadromous rainbow forms on the MHNH and fish suspected to be Redband trout have been found in the Zigzag, Still, and Upper Sandy River Watersheds as recently as 2003. Rainbow trout possessing external phenotypic characteristics similar to those of Redband trout have been documented in fish caught in the Still Creek (RM 0.5) and Lost Creek (RM 1.0) smolt traps, both operated in the upper Sandy River Basin.

Genetic samples taken and analyzed by ODFW (ODFW, 1997) were inconclusive in identifying the full extent of distribution of Redband trout in tributaries draining Mt. Hood. Until genetic identification of these fish can be made, effects determinations can only be based on assumed or suspected presence. Therefore, Redband trout are suspected to occur within the project area of the Zigzag River, Still Creek and Camp Creek.

## Survey and Manage

### Columbia dusky snail (*Lyogyrus n. sp. 1*)

This species of aquatic mollusk has been found across the Sandy River basin and MHNH during surveys conducted over the past several years. Although surveys have not been conducted in the Project Area, they are likely present. Habitat requirements for this species are fairly specific: cold, well oxygenated springs, seeps, and small streams, preferring areas without macrophytes (macroscopic emergent and submerged aquatic plants), but they may occur in areas with watercress and water hemlock. Individuals have not been found in larger streams and rivers, or glacial streams.

Potential habitat for the Columbia duskysnail occurs in the Project Area. Based on habitat definitions and known locations for this species, all seeps, springs, and small, non-glacial streams such as Camp Creek and clear water tributaries or springs within the project area are identified as potential habitat.

### Basalt Juga (*Juga Oreobasis*)

These small snails have not been found on the Mt. Hood National Forest and based on the last several years of surveys, are not expected to be found in the Project Area. They have been found at two locations within the Oregon portion of the Columbia River Gorge National Scenic Area: in Canyon Creek near Hood River and in several small seeps just south of Interstate 84 near The Dalles Dam. Their habitat is restricted to springs in small drainages tributary to the Columbia River in the Columbia Gorge, at low elevations.

## **Critical Habitat** (NOAA Fisheries and USFWS)

Critical habitat has been designated for Lower Columbia River steelhead trout and Lower Columbia River chinook salmon effective of January 2006 by the National Marine Fisheries Service (70 FR 52630, September 2, 2005). No critical habitat has been designated for coho salmon. Designated critical habitat for LCR steelhead and chinook salmon is to RM 14.8 on the Zigzag River, to RM 9.9 on Still Creek and RM 5.75 on Camp Creek. Discussion concerning critical habitat, including effects analyses, will center on the Primary Constituent Elements (PCE) described for each species (NOAA, 2005).

Primary constituent elements for steelhead and chinook salmon are sites and habitat components that support one or more life stages. The first three, listed below, refer to freshwater habitat components, whereas the other three relate to estuarine or marine habitat components. Nothing proposed in any alternative outlined in this BE would have any effect on estuarine or marine habitat components, thus they are not listed nor discussed.

Primary constituent elements for steelhead and chinook salmon:

- I. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
- II. Freshwater rearing sites with:
  - a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
  - b. Water quality and forage supporting juvenile development; and
  - c. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- III. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

## **Effects Determinations**

The existing condition and the physical and biological processes operating within a watershed will be the baseline from which project proposals and analysis is based. As such, the existing recreational residence tracts and actions that are present on the face of the existing Special Use Permits are included as a component of the environmental baseline. Furthermore, the LRMP has deemed this is a valid use of USFS lands and has given specific direction to their management through A10 land allocations.

## **Field Surveys**

Field surveys were completed by Zigzag Ranger District fisheries and hydrology personnel for these five tracts between June 28, 2005 to April 19, 2007. Survey forms were completed for each of the 478 summer homes. When compliance issues were identified they were documented and initial corrective prescriptions were developed (Appendix A, Table 1) summarized those issues.

## **Direct Effects**

### No Action

Immediately following permit expiration there would be no change from the current baseline conditions, thus no direct effect to aquatic species or their habitat. Over the next 10 years permit holders would remove all structures (see Indirect Effects - No Action). No direct effect to PETS listed aquatic species and their critical habitat is anticipated from the No Action Alternative.

### Proposed Action

Issuance of a 20-year Special Use Permit to each of the 478 Recreational Residence will not allow or support any activities to occur in perennial or intermittent stream channels or to directly affect water quality. Implementation of the required corrective measures identified in Appendix A, Table 1 may cause localized ground disturbance, but no sedimentation or other negative affect would be transmitted to stream channels. Therefore, there will be no direct effects to aquatic species and their critical habitat from the Proposed Action.

## **Indirect Effects**

### No Action Alternative

The No Action Alternative would result in the current permits expiring and recreational residence use would not continue on the Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain tracts. Immediately following permit expiration there would be no change from the baseline conditions. However, that could change both in scale and time as recreational residence owners start to remove their structures from the landscape by the deadline prescribed by the USFS. This would likely be within 10 years of permit expiration.

### Short Term Effects

Structure removal activities would include removal of the cabin, outbuildings, waterlines, driveway, culverts, fire rings, and trails from each of the 478 lots. Typical construction equipment would include hand crews, pickup trucks, dump trucks and track-mounted excavators. Prior to any ground disturbance activities, the USFS would prescribe design criteria and Water Quality Protection Best Management Practices (BMP's) that would need to be adhered to.

Once removal of existing structures begins, there would be areas of exposed mineral soils commensurate with typical demolition activities. This would include removal of the cabin, foundations, piers and footings. Excavation and removal of all water lines and sewer lines as well as septic tanks, cesspools, drain fields and sand filter systems. Removal would likely impact adjacent trees and native vegetation. Removal of all culverts on access roads as well as removal of the access road itself will also result in soil and vegetation disturbance. During these activities, there would likely be at least 1,500 square feet of disturbed soil per lot. This could increase to 2,500 to 3,000 square feet per lot, for those lots with a long access road. USFS BMP's would be required to minimize any soil movement or sedimentation reaching watercourses. All disturbed soil and non-vegetated areas would be required to be replanted with native shrubs and tree species. With the number of cabins (478) being removed and the number of different contractors and work crews working in the small area of these five tracts, mobilization of sediment could result though it would likely be on the first terrace or on the rare occasion, the flood plain.

Demolition activities may impact existing shrubs and trees. As part of the USFS BMP's and design criteria, each permittee would be required to mitigate these effects by planting native vegetation to replace any damaged during demolition. Adverse effects to shade production would not likely occur because most areas are fully stocked with a multi-layered canopy. In the event trees are cut down, adverse effects to LWD recruitment would likely be immeasurable for the same reasons.

#### Long Term Effects

In the long term, each lot would recover, restoring functioning riparian forest types. Planted native vegetation would develop in a similar fashion as early seral stands. Riparian trees would grow and provide a new canopy layer below existing layers. All bare soil surfaces would soon be covered with vegetation, as growing conditions within the Zigzag Watershed are conducive to rapid growth and vigor. These conditions would continue until a natural event such as a wind or snowstorm or fire alters development through natural processes. This would likely be taking place within 3 to 5 year following removal of recreational residences cabins and associated structures.

Effects to critical habitat would be associated with the effects described above. Effects to the primary constituent elements of freshwater spawning, rearing and migration would be encompassed within those descriptions.

Best management practices would protect water quality for aquatic mollusks, and any effect to aquatic mollusks would be insignificant.

#### Proposed Action

The Proposed Action is to authorize continued recreation residence use on Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain tracts for up to a 20-year period. As part of continued use, each of the 478 permittees must comply with all of the terms and conditions of their permit. It is important to remember any future improvements such as repairs, modification of existing bank revetments or hazard tree removals will be analyzed in a separate, site-specific NEPA document. Items identified in Appendix A, Table 1 will need to be corrected within 5 years of issuance of the new permit. Implementation of these compliance actions will include typical construction equipment, hand crews, pickup trucks, dump trucks and track-mounted excavators. Prior to ground disturbance, the USFS will prescribe design criteria and Water Quality Protection Best Management Practices (BMP's) to minimize the potential for adverse effects to aquatic resources.

#### Short Term Effects

Possible short-term impacts to aquatic species or their habitat include degradation of water quality through chemical contamination, sediment and turbidity and increased stream temperature. Other possible effects include water withdrawals and changes to riparian stand structure and composition.

#### Chemical Contamination

All recreational residences are required to have a certified Clackamas County septic system in place before the new Special Use Permit is issued. These systems need to be functioning to the standard of the date of installation. This means that if an outhouse was installed then it needs to be in a functioning condition, away from waterbodies and having no detectable adverse effect to water quality. For all recently installed and future systems, Clackamas County requires setbacks from streams and the use of alternative system such as pressure distribution systems and drain fields to ensure that effluent does not reach waterways. Currently, all existing out houses and drain fields in the five recreational residence tracts are located at least 50 lineal feet or greater from water bodies and perched on the first or second terrace. Effects

generated from these structures have a very low probability of reaching PETS habitat and as per Clackamas County code should not have a detectable adverse effect to water quality.

#### **Sediment/Turbidity**

The possibility for the generation of sediment at each lot is tied to specific activities such as walking, digging and vehicle use of the driveway and parking areas. All of the 478 recreational residence lots are well vegetated with ground cover and shrubs. Most are dominated by a multi-layered stands of mid to late-seral conifers. For those lots that have been identified in Appendix A, Table 1 with issues of artificial lawn or cut vegetation still have adequate ground cover, though non-native or pruned. Foot trails leading from structures to streams are single tread and are either native soil or duff. Designated parking areas are usually covered in ½” to 1” crushed gravel or are native surface. The probability of sediment being generated by foot traffic is low due to the infrequent use of the recreational residence, the amount of vegetation along the trails and the relatively flat terrain of each trail. Digging is not an allowed activity as part of the permit and requires prior authorization from the USFS, and thus will be covered under a site-specific analysis. Parking areas are usually located on the first or second terrace at least 50’ to greater than 300’ from PETS habitat. Due to the low magnitude of each individual project, BMP’s that will protect water quality, with no overlap spatially, there is no probability of sediment reaching the stream.

#### **Stream Temperature.**

Most stands within the recreational residence tracts are mid-seral to late-seral with remnant old growth sized trees. These stands are fully stocked, providing sufficient LWD recruitment, stream shade and bank stability. There is no proposal to remove shade-producing trees with the Proposed Action and thus no affect to shade on PETS habitat will result.

#### **Water Withdrawals**

There is no permitted water withdrawals by any of the 478 permittee’s and thus no effects to water quantity are expected.

#### **Long Term Effects**

In the long term, there are no foreseeable adverse effects from the proposed action. Once implemented, beneficial effects from implementing corrective action identified in Appendix A, Table 1 will incrementally improve site conditions. Because of their small size and distribution in the Action Area, these improvements will not be detectable beyond this scale.

Effects to critical habitat would be associated with the effects described above. Effects to the primary constituent elements of freshwater spawning, rearing and migration would be encompassed within those descriptions.

Best Management Practices (BMP’s) would protect water quality for aquatic mollusks, and any effect to aquatic mollusks would be insignificant.

#### **NEPA Cumulative Effects**

See description in Categorical Exclusion of the project. There is no overlap in space and time and there are no NEPA cumulative effects identified.

## ESA Cumulative Effects

ESA cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation [50 CFR section 402.02]. There are no non-federal projects occurring in the Action Area.

## Conclusions

### No Action Alternative

The No Action Alternative would allow the existing Special Use Permits to expire on December 31, 2008. All structures currently under Special Use Permit for each of the 478 Recreational Residences in the Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain tracts will be removed, most likely within 10 years of permit expiration. These actions will generate concentrated areas (1500 square feet or greater) of exposed mineral soil mostly within riparian reserves over 10 years. Each permittee will be required to follow USFS BMP's and design criteria to minimize and contain any negative effects. Because of the distance from activities to stream channels, project generated sediment will likely be mitigated by BMP's or captured by existing riparian vegetation. However, given the high number of these actions, there is a small chance sediment may reach PETS habitat though the magnitude would be small and of short duration. For those reasons, a **May Affect, Not Likely to Adversely Affect (NLAA)** determination for LCR Steelhead, LCR coho, and LCR Chinook salmon and their spawning, rearing and migration corridor habitats is warranted. A **May Affect, Not Likely to Adversely Affect (NLAA)** determination for LCR Steelhead and LCR Chinook salmon Critical Habitat is warranted. Over the long term, the No Action would likely result in **No Effect** to federally listed aquatic species and their critical habitats.

The No Action Alternative **May Impact Individuals or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To the Population or Species (MIIH)** on Forest Service Sensitive species Redband trout and LRMP Management Indicator Species Cutthroat Trout. Over the long-term, the No Action alternative will have **No Impact (NI)** to these species.

Due to a potential of small, immeasurable short term sedimentation effects, the proposed action **May Impact Individuals or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To the Population or Species (MIIH)** of Survey and Manage Columbia Dusky Snail. The No Action alternative will have **No Impact (NI)** on Basalt Juga. This project is consistent with the 2001 Record of Decision for Survey and Management standards and guidelines as amended or modified as of March 21, 2004.

The No Action alternative will have **No Effect (NE)** on Columbia River Bull Trout.

### The Proposed Action Alternative

The Proposed Action is for the USFS to authorize continued recreation residence use on the Mile Bridge, Still Creek, Vine Maple, Camp Creek and Flag Mountain tracts for up to a 20-year period beginning January 1, 2009. As such, occupancy of these lots are part of the baseline environmental conditions as the USFS has deemed this activity is the best use of these lands and provides management direction in the LRMP, specifically in the A10 Developed Recreation and B7 General



Riparian Area Management Land Allocations. Permittee's must comply with all of the Terms and Conditions of their permit.

Because of the distance of each structure (and the infrequent use) to any perennial or intermittent channels, sediment generated from permitted activities would have a very low probability to reach those channels. Furthermore, corrective measures identified in Appendix A, Table 1 are independent actions of each other, implemented randomly over the next five years. All effects are contained on-site within the footprint of each project. None of the actions are interrelated with each other and thus there will likely be no cumulative or additive effects. Over time, there will likely be long-term beneficial effect on each site, though likely immeasurable. For these reasons, there would be an insignificant effect to aquatic species and warrant a **No Effect** determination is made for LCR Steelhead, LCR coho and LCR chinook salmon, and CR Bull Trout is warranted. There is no predicted effect to the freshwater spawning, rearing and migration corridor components of critical habitat.

The Proposed Action Alternative would result in **No Impact** to Survey and Manage Aquatic Snails or their habitats.

The Proposed Action Alternative will have **No Impact** on Forest Service Sensitive species Redband trout.

## **Determination of Effect Essential Fish Habitat**

Public law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to establish new requirement for Essential Fish Habitat (EFH) descriptions in Federal fishery management plans and to require Federal agencies to consult with NMFS on activities that may adversely affect EFH. "Essential Fish Habitat" means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Act). The Pacific Fisheries Management Council (PFMC) has recommended an EFH designation for the Pacific salmon fishery that would include those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (i.e. properly functions habitat conditions necessary for the long-term survival of the species through the full range of environmental variation).

Salmon fishery EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to coho and chinook salmon in Washington, Oregon, Idaho, and California, except above the impassable barriers identified by PFMC (PFMC 1999). Salmon EFH excludes areas upstream of longstanding naturally impassable barriers (i.e. natural waterfalls in existence for several hundred years). Three salmonids species are identified under the MSA, chinook salmon, coho salmon and Puget Sound pink salmon.

The No Action Alternative allows the existing permits to expire and requires that all permitted structures be removed from the landscape within 10 years. Demolition of these structures will likely cause 1,500 to 2,500 square feet of bare soil on each lot for a short amount of time. There is a low probability an insignificant amount of sediment generated on these lots may enter PETS habitat. Implementing all prescribed design criteria and USFS BMP's should minimize this opportunity. Because of the low potential delivery of an insignificant amount of sediment to EFH, the No Action Alternative would **Not Adversely Affect Essential Fish Habitat** for Chinook and coho salmon.

The Proposed Action to issue a new 20-year Special Use Permit to each of the 478 permit holders will have **No Adverse Affect on Essential Fish Habitat** for chinook and coho salmon under the 1996 Amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

## AQUATIC CONSERVATION STRATEGY CONSISTENCY REPORT

The Proposed Action meets the attainment of ACS Objectives in the long term at the landscape level by maintaining all of the features addressed by the ACS at the 5<sup>th</sup> field scale and 6<sup>th</sup> field scale. Data available in the Zigzag Watershed Analysis, 1995 and the Zigzag Watershed Analysis Update, 2004 was used to evaluate the Proposed Action and how it may affect watershed processes and functions outlined in these documents. Implementing corrective measures outlined in Appendix A. Table 1 may result in localized ground disturbance on specific lots that have embarked on those activities. However, their effects will be limited to the size of the recreational residence lot and will not contribute to incremental effects past that scale. In the long term, improved stand and riparian conditions at the site scale should be realized, though probably immeasurably.

ACS Objective 1. Maintain or restore the distribution, diversity, and complexity of the watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

ACS Objective 2. Maintain or restore spatial and temporal connectivity within and between watersheds.

ACS Objective 3. Maintain or restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

ACS Objective 4. Maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.

ACS Objective 5. Maintain or restore the sediment regime under which aquatic ecosystems evolved.

ACS Objective 6. Maintain or restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.

ACS Objective 7. Maintain or restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.

ACS Objective 8. Maintain or restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

ACS Objective 9. Maintain or restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

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## Appendix A

Table 1. Aquatic and riparian compliance issues.

<b>Road Number</b>	<b>Lot Number</b>	<b>Tract Name</b>	<b>Issue Identified</b>	<b>Corrective Measures Needed for Permit Compliance</b>
2632	12	Camp Creek	Excessive exposed mineral soil associated with parking area and between cabin and edge of terrace.	Identify parking for 2 vehicles. Decompact other soil surfaces and plant all open areas with native conifers and shrubs
2634	38	Camp Creek	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2634	48	Camp Creek	Old water line suspended above channel. Areas of cleared vegetation affecting stand structure and composition.	Remove all old infrastructure, including waterline, cable and water catch-basin (if present). Replant all open areas with native trees and shrubs.
2634	52	Camp Creek	Old oil tank under deck near edge of 1 <sup>st</sup> terrace. Deck overhanging terrace, bank erosion present.	Remove or move oil tank and correct erosion source.
2634	64	Camp Creek	Deck built over existing tributary channel. Diversion dam and pump house in tributary channel.	Remove deck and footings. Remove diversion dam and all associated infrastructure.
2628B	1	Camp Creek	Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Replant all open areas with native trees and shrubs.
2628B	5	Camp Creek	Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Replant all open areas with native trees and shrubs.
2628B	7	Camp Creek	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2628B	15	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628A	17	Camp Creek	Areas of cleared vegetation affecting stand structure and composition. Areas of bare soil associated with construction activities.	Replant all open areas with native trees and shrubs. Cover all bare soil surfaces with erosion control straw.
2628A	19	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628A	21	Camp Creek	Areas of cleared vegetation for picnic area next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs

2628A	23	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628A	25	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628A	27	Camp Creek	Deck footings on edge of terrace causing erosion. Areas of cleared vegetation.	Move deck footings and stabilize bank with native vegetation.
2628A	31	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628A	33	Camp Creek	Areas of cleared vegetation and planted lawn affecting stand structure and composition	Remove lawn and replant all open areas with native trees and shrubs
2628	6	Camp Creek	Hot tub on deck 100' from channel.	Check on issues.
2628	8	Camp Creek	Areas of cleared vegetation for picnic area next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628	14	Camp Creek	Areas of cleared vegetation and planted lawn affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628	16	Camp Creek	Areas of cleared vegetation and planted lawn affecting stand structure and composition	Replant all open areas with native trees and shrubs
2628	20	Camp Creek	Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Replant all open areas with native trees and shrubs.
2628	32	Camp Creek	Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Replant all open areas with native trees and shrubs.
2628	36	Camp Creek	Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Replant all open areas with native trees and shrubs.
2628	38	Camp Creek	Excessive exposed mineral soil associated with parking area. Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Identify parking for 2 vehicles. Decomact other soil surfaces and plant all open areas with native conifers and shrubs
2628	40	Camp Creek	Riparian flood prone elevation has no conifers.	Replant flood prone area with conifer seedlings.
2628	42	Camp Creek	Excessive exposed mineral soil associated with parking area. Areas of cleared vegetation affecting stand structure and composition between cabin and Camp Creek.	Identify parking for 2 vehicles. Decomact other soil surfaces and plant all open areas with native conifers and shrubs

2630C	2	Camp Creek	Large deck with footings on slope above channel.	Replant all bare soil areas with native trees and shrubs. Remove deck footings from bank slope.
2630C	4	Camp Creek	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs.
2630C	10	Camp Creek	Excessive parking area on lot. Areas of cleared vegetation affecting stand structure and composition.	Identify parking for 2 vehicles. Decomact other soil surfaces and plant all open areas with native conifers and shrubs.
2630C	12	Camp Creek	Excessive parking area on lot. Areas of cleared vegetation affecting stand structure and composition.	Identify parking for 2 vehicles. Decomact other soil surfaces and plant all open areas with native conifers and shrubs.
2630C	14	Camp Creek	Areas of cleared vegetation on first terrace affecting stand structure and composition	Replant all open areas with native trees and shrubs.
2630B	3	Camp Creek	No issues identified.	No issues identified.
2630B	4	Camp Creek	Deck constructed over Camp Creek.	Reduce size of deck so that it does not over hang the creek.
2630B	5	Camp Creek	Excessive driveway areas in riparian area.	Remove on of the existing two driveways and replant with native shrubs and trees. Evaluate drainage off concrete pad for hot tub.
2630B	7	Camp Creek	Excessive driveway and parking areas in riparian area.	Remove on of the existing two driveways and parking areas and replant with native shrubs and trees.
2630B	9	Camp Creek	Excessive parking area on lot. Areas of cleared vegetation affecting stand structure and composition	Identify parking for 2 vehicles. Decomact other soil surfaces and plant all open areas with native conifers and shrubs.
2630B	11	Camp Creek	Areas of cleared vegetation for picnic area next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2630B	13	Camp Creek	Areas of cleared vegetation for picnic area next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2630	44	Camp Creek	Areas of cleared vegetation for picnic area and trail next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs.
2630	46	Camp Creek	Exposed drain field present during survey. Pruned riparian vegetation present.	Correct septic issues, stop pruning vegetation and replant all open areas with native trees and shrubs.



2630	48	Camp Creek	Areas of cleared vegetation for picnic area and trail next to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs.
2630	50	Camp Creek	Areas of cleared conifer and hardwood trees adjacent to Camp Creek affecting stand structure and composition	Replant all open areas with native trees.
2630	52	Camp Creek	Areas of cleared vegetation adjacent to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2630	54	Camp Creek	Areas of cleared vegetation adjacent to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2630	58	Camp Creek	Areas of cleared vegetation adjacent to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2630	64	Camp Creek	Areas of cleared vegetation adjacent to Camp Creek affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	1	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	3	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	5	Mile Bridge	Areas of cleared vegetation between cabin and Zigzag River affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	7	Mile Bridge	Not recommended to develop lot due to proximity to the Zigzag River.	In lieu lot
2629	9	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	19	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	21	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	27	Mile Bridge	Areas of cleared vegetation adjacent to the Zigzag River affecting stand structure and composition	Replant all open areas with native trees and shrubs
2629	31	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition between cabin and	Replant all open areas with native trees and shrubs

			Zigzag River side channel.	
2629	33	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition between cabin and Zigzag River side channel.	Replant all open areas with native trees and shrubs
2629	35	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	43,49,45, 51,53	Mile Bridge	Lots on 1 <sup>st</sup> terrace above the Zigzag River. Riparian stands intact provide refugia surrounded by development. Not recommended for development.	In lieu lots
2631	47	Mile Bridge	Areas of cleared vegetation and trails affecting stand structure and composition between cabin and Zigzag River side channel.	Replant all open areas with native trees and shrubs. Remove excessive trails.
2631	57	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	61	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	67	Mile Bridge	Areas of cleared vegetation adjacent to the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2631	69	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	71	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	73	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	81	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	91	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	95	Mile Bridge	Areas of cleared understory vegetation adjacent to the Zigzag River affecting stand structure and composition	Replant all open areas with native trees and shrubs
2631	99	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2635	127	Mile Bridge	Areas of cleared vegetation and trails affecting stand structure and composition between cabin	Replant all open areas with native trees and shrubs. Remove excessive trails and

			and Zigzag River side channel. Deck over edge of terrace.	decrease deck size.
2635	137	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2635	143	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition	Replant all open areas with native trees and shrubs
2635	145	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition	Replant all open areas with native trees and shrubs
2635	147	Mile Bridge	Areas of cleared understory vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2635	149	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2635	155	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2635	157	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2635	159	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2635	161	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2628A	2	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2628A	4	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2628A	8	Mile Bridge	Areas of cleared and pruned understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Stop pruning vegetation and replant all open areas with native trees and shrubs
2628A	16	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2628A	18	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs. Hot tub within 45' of river, evaluate spill plan.
2628A	20	Mile Bridge	Areas of cleared vegetation	Replant all open areas with

			between cabin and the Zigzag River affecting stand structure and composition.	native trees and shrubs.
2628A	22	Mile Bridge	No issues identified.	No issues identified.
2626	09, 20	Mile Bridge	Located on 5 to 10 yr flood plain, not recommended for development.	In lieu lots
2626	23	Mile Bridge	Located on 2 <sup>nd</sup> terrace. May be developed but need to mitigate any adverse effects to stream.	In lieu lot.
2626	11	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2626	13	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2626	15	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition. Stream banks seem to have rip rap present	Replant all open areas with native trees and shrubs. Need to evaluate riprap.
2626	16	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2626	17	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition. Stream banks seem to have rip rap present	Replant all open areas with native trees and shrubs. Need to evaluate riprap.
2626	18	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2626	19	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2626	21	Mile Bridge	Areas of cleared understory vegetation and downed wood between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	5	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	7	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	11	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand	Replant all open areas with native trees and shrubs.

			structure and composition.	
2635B	13	Mile Bridge	Areas of cleared vegetation and user trails between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	15	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	17	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	19	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635B	21	Mile Bridge	Areas of thinned and removed understory between cabin and Zigzag River.	Replant all open areas with native trees and shrubs
2635B	23	Mile Bridge	Areas of thinned and removed native vegetation between cabin and Zigzag River.	Replant all open areas with native trees and shrubs.
2635B	27	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	1	Mile Bridge	Areas of cleared understory vegetation and picnic area and fire pit between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	2	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	4	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	10	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition. Excessive exposed mineral soil noted.	Replant all open areas with native trees and shrubs. Stabilize all bare soil areas.
2635A	12	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition. Excessive exposed mineral soil noted.	Replant all open areas with native trees and shrubs. Stabilize all bare soil areas.
2635A	14	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand	Replant all open areas with native trees and shrubs.

			structure and composition.	
2635A	16	Mile Bridge	Deck and hot tub on terrace above Zigzag River. Areas of cut vegetation near the river.	Evaluate location of hot tub and spill prevention. Evaluate proximity of deck to channel.
2635A	18	Mile Bridge	Areas of cleared understory vegetation to the edge of the terrace between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	20	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	22	Mile Bridge	Areas of cleared vegetation and excessive user trails between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs. Remove and rehabilitate excessive trails.
2635A	24	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	26	Mile Bridge	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	28	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River wetted channel affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	30	Mile Bridge	Cleared area with seating bench adjacent to the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	32	Mile Bridge	Cleared area with seating bench adjacent to the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	38	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition. House and deck near bankfull channel.	Replant all open areas with native trees and shrubs. Evaluate deck location.
2635A	40	Mile Bridge	Areas of cleared vegetation and user trails between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs. Remove and rehabilitate excessive trails.
2635A	42	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	44	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand	Replant all open areas with native trees and shrubs. Stabilize all bare soil areas.

			structure and composition. Excessive exposed mineral soil noted.	
2635A	46	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition. Excessive exposed mineral soil noted.	Replant all open areas with native trees and shrubs. Stabilize all bare soil areas.
2635A	48	Mile Bridge	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand structure and composition. Excessive exposed mineral soil noted.	Replant all open areas with native trees and shrubs. Stabilize all bare soil areas and evaluate hot tub spill plan..
2635A	50	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	56	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition. Above ground oil tank near channel.	Replant all open areas with native trees and shrubs. Evaluate ability to move oil tank farther from channel.
2635A	58	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2635A	70	Mile Bridge	Areas of cleared/thinned vegetation between cabin and the Zigzag River affecting stand structure and composition. Fire pit present on sand bar of river.	Stop thinning and replant all open areas with native trees and shrubs. Obliterate and stop use of fire ring.
2635A	72	Mile Bridge	Areas of cleared/thinned vegetation between cabin and the Zigzag River affecting stand structure and composition. Fire pit and benches present on 1 <sup>st</sup> terrace above river.	Stop thinning and replant all open areas with native trees and shrubs. Obliterate and stop use of fire ring.
2627	2	Mile Bridge	Areas of cleared/thinned vegetation between cabin and the Zigzag River affecting stand structure and composition. Several user trails to stream. Heavy bank armoring present.	Replant all open areas with native trees and shrubs. Remove and rehabilitate excessive trails. Work with ODOT on bank armoring, as it is likely associated with Mile Bridge.
2627	4	Mile Bridge	Areas of cleared/thinned vegetation between cabin and the Zigzag River affecting stand structure and composition. Several user trails to stream. Heavy bank armoring with gabions present.	Replant all open areas with native trees and shrubs. Remove and rehabilitate excessive trails. Work with ODOT on bank armoring, as it is likely associated with Mile Bridge.

2627	6	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition. House and deck located near stream.	Replant all open areas with native trees and shrubs. Evaluate proximity of deck to wetted channel.
2627	8	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2627	10	Mile Bridge	Areas of cleared vegetation between cabin and the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	5	Vine Maple	Open areas on lot, lacking vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	8	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	10	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	12	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition. Excessive size of driveway.	Evaluate driveway size and decrease footprint. Replant all open areas with native trees and shrubs
2620	14	Vine Maple	Old oil tank sitting on ground surface in ephemeral channel.	Remove or move oil tank to a secure location.
2620	16	Vine Maple	Hot tub located on 1 <sup>st</sup> terrace above the channel.	Evaluate spill prevention into the Zigzag River
2620	18	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	20	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition. Picnic table within 3' of wetted channel.	Replant all open areas with native trees and shrubs. Move picnic table from edge of channel.
2620	22	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition. Areas of bare soil.	Replant all open areas with native trees and shrubs. Rehab. bare soil areas.
2620	28	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	32	Vine Maple	Areas of cleared vegetation and artificial lawn affecting stand structure and composition	Remove lawn and replant all open areas with native trees and shrubs



2620	34	Vine Maple	Open areas on lot, lacking vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	36	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. Excessive user trails noted.	Replant all open areas with native trees and shrubs. Evaluate, remove and rehabilitate excessive trails.
2620	38	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	40	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	42	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	44	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition. Tables adjacent to wetted channel.	Replant all open areas with native trees and shrubs. Move tables.
2620	46	Vine Maple	Area between the cabin and Still Creek is lacking conifers, affecting stand structure and composition. Oil tank not secure.	Replant all open areas with native trees. Secure tank.
2620	50	Vine Maple	Excessive parking area and driveway on lot affecting stand structure and composition	Identify parking for 2 vehicles and appropriate driveway size. Decompact excessive areas and plant all open areas with native conifers and shrubs.
2620	52	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition. Excessive parking area and user trails.	Replant all open areas with native trees and shrubs. Prove parking for 2 vehicles and remove excessive parking and trails. Rehab. all open areas.
2620	54	Vine Maple	Large deck with evidence of cleared overstory trees affecting stand structure and composition.	Replant all open areas with native trees and shrubs. Evaluate deck size and modify if exceeding size limit.
2620	56	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620	58	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs.

2620	62	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition.	Replant all open areas with native trees and shrubs
2620	63	Vine Maple	2 Access roads on lot, cleared vegetation and artificial lawn affecting stand structure and composition.	Remove lawn. Identify parking for 2 vehicles and appropriate driveway size. Decompact excessive areas and plant all open areas with native conifers and shrubs.
2620	65	Vine Maple	Areas of cleared vegetation and bare soil affecting stand structure and composition.	Replant all open areas with native trees and shrubs. Cover open areas with grass seed and mulch.
2620	67	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Still Creek affecting stand structure and composition. Noxious weeds on site. Gutters broke.	Replant all open areas with native trees and shrubs. Treat noxious weeds and fix gutters.
2620C	1	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620D	3	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Zigzag River affecting stand structure and composition. Noxious weeds on site. 2 access roads on lot.	Replant all open areas with native trees and shrubs. Treat noxious weeds and remove and rehab one access road.
2620D	5	Vine Maple	Areas of cleared vegetation between the cabin to the edge of the Zigzag River affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620D	7	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620D	9	Vine Maple	Areas of cleared understory vegetation and pruned trees affecting stand structure and composition.	Stop pruning trees. Replant all open areas with native trees or shrubs.
2620D	11	Vine Maple	Picnic area directly above stream with benches and a fire ring affecting stand structure and composition.	Decompact site, move tables and replant all open areas with native trees and shrubs.
2620D	13	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. Stream bank has been armored with boulders.	Work with District Aquatics Staff to evaluate bank armoring and rehab. as necessary. Replant all open areas with native trees or shrubs.
2620D	15	Vine Maple	Areas of cleared understory vegetation between cabin and the Zigzag River affecting stand	Replant all open areas with native trees or shrubs. Work with District Aquatics Staff to

			structure and composition. Stream bank has been armored with boulders.	evaluate bank armoring and rehab. as necessary.
2620D	17	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2612	7, 20, 49,	Vine Maple	Lots located on flood plain, 1 <sup>st</sup> or 2 <sup>nd</sup> terrace. Large diameter trees present.	In lieu lots. Not recommended to develop due to impacts to residual trees and proximity of the Zigzag River to the lots.
2612	9	Vine Maple	Trail along perennial tributary. Excessive driveway/ parking affecting stand structure and composition.	Remove trail. Remove and rehabilitate excessive driveway. Replant all open areas with native trees or shrubs.
2612	11	Vine Maple	Excessive cutting and pruning of vegetation along access trail to Still Creek.	Stop cutting vegetation and Replant all open areas with native trees or shrubs.
2612	13	Vine Maple	Excessive cutting and pruning of vegetation along access trail to Still Creek.	Stop cutting vegetation and Replant all open areas with native trees or shrubs.
2612	21	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2612	23	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. Old fire pit within 10 of wetted channel.	Replant all open areas with native trees or shrubs. Move fire pit.
2612	35	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2612	37	Vine Maple	Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition. Ground has been raked, removing duff layer. Excessive user trails on lot.	Stop raking lot. Remove excessive user trails. Replant all open areas with native trees or shrubs.
2612	47	Vine Maple	No issued identified.	No issues identified.
2612	51	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. Gutters broke.	Replant all open areas with native trees or shrubs. Fix gutters.
2612	53	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs. Fix gutters.
2612	55	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. Gutters broke. Hot tub located in ephemeral channel.	Replant all open areas with native trees or shrubs. Fix gutters. Move hot tub.
2612	57	Vine Maple	Areas of cleared vegetation between cabin and Still Creek affecting stand structure and	Replant all open areas with native trees or shrubs. Fix gutters.

			composition. Gutters broke.	
2612	59	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2612	61	Vine Maple	Areas of cleared vegetation affecting stand structure and composition. New fine textured gravel on driveway with noticeable surface erosion.	Replant all open areas with native trees and shrubs. Fix driveway erosion problems.
2612	63	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2612	67	Vine Maple	Areas of cleared and thinned vegetation affecting stand structure and composition.	Stop thinning vegetation. Replant all open areas with native trees or shrubs.
2612	69	Vine Maple	Areas of cleared and thinned vegetation affecting stand structure and composition.	Stop thinning vegetation. Replant all open areas with native trees or shrubs.
2612	71	Vine Maple	Areas of cleared and thinned vegetation between cabin and Still Creek affecting stand structure and composition. Gutters broke and drain toward creek. Brown vegetation.	Replant all open areas with native trees or shrubs. Fix gutters. Stop pruning vegetation.
2612	81	Vine Maple	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees or shrubs.
2626	3	Still Creek	Large area for parking. 2 access roads to lot. Water coming off back of cabin into intermit. stream.	Remove and decompact excessive parking areas and close and rehabilitate 1 access road. Correct drainage issues.
2626	5	Still Creek	Large parking area. Areas of cleared vegetation between cabin and the Still Creek affecting stand structure and composition. Non-native vegetation present.	Decompact and obliterate excessive parking areas. Replant all open areas with native trees and shrubs. Remove non-native veg.
2612A	1	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2612A	3	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2612A	5,7,9,11,13	Still Creek	Lots located on flood plain or the 1 <sup>st</sup> terrace. Existing stands are providing a good buffer and refugia to surrounding developed lots.	In lieu lots. Not recommended to develop due to impacts to residual trees and proximity of the lots to Still Creek.
2612A	15	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.

2612A	26	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2614	4	Still Creek	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2614	8	Still Creek	Areas of pruned and cleared vegetation affecting stand structure and composition.	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2614	10	Still Creek	Areas of pruned and cleared vegetation affecting stand structure and composition.	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2614	12	Still Creek	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2613	1	Still Creek	Hot tub pad drains into ephemeral channel of Still Creek.	Correct drainage issues from hot tub.
2613	3	Still Creek	Areas of cleared vegetation between cabin and Still Creek affecting stand structure and composition. Above ground oil tank on blocks behind cabin.	Stop pruning vegetation. Replant all open areas with native trees and shrubs. Secure oil tank.
2613	7	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2613	9	Still Creek	Areas of pruned and cleared understory vegetation between cabin and Still Creek and the Zigzag River affecting stand structure and composition	Stop pruning vegetation. Replant all open areas with native trees and shrubs.
2610	1	Still Creek	Areas of pruned and cleared vegetation between cabin and Still Creek affecting stand structure and composition. Excessive parking areas.	Stop pruning vegetation. Replant all open areas with native trees and shrubs. Close, decompact and replant excessive parking areas.
2610	27	Still Creek	Areas of pruned and cleared vegetation affecting stand structure and composition. Evidence of firewood cutting of down large woody debris.	Stop pruning vegetation. Replant all open areas with native trees and shrubs. Stop cutting down large woody debris.
2610	3,5,7,9,11,13,15,17,19,21	Still Creek	Lots located on flood plain or the 1 <sup>st</sup> terrace. Existing stands are providing a good buffer and refugia to surrounding developed lots.	In lieu lots. Not recommended to develop due to impacts to residual trees and proximity of the lots to Still Creek.
2613	5	Still Creek	Areas of cleared vegetation affecting stand structure and composition.	Replant all open areas with native trees and shrubs.
2620-D	30	Flag Mountain	Areas of cleared vegetation affecting stand structure and	Replant all open areas with native trees and shrubs.

			composition.	
2620-D	34	Flag Mountain	Areas of cleared vegetation affecting stand structure and composition. Pruned riparian trees.	Stop pruning native vegetation. Replant all open areas with native trees and shrubs.
2620-D	38	Flag Mountain	Access road within 40' of Zigzag River effecting stand structure and composition and LWD recruitment.	Replant all open areas with native trees and shrubs. Evaluate ability to move access road away from stream.
2620-D	40, 42	Flag Mountain	Lots located on flood plain or the 1 <sup>st</sup> terrace. Existing stands are providing a good buffer and refugia to surrounding developed lots.	In lieu lots. Not recommended to develop due to impacts to residual stand and proximity of the lots to the very near proximity to the Zigzag River.

**Appendix B**  
**Clackamas County Septic Information**

## **Appendix C**

### **USFS Water Quality Protection Best Management Practices**

If during project implementation new streams, wetlands, lakes or ponds are identified the appropriate riparian reserves will be delineated and the standards and guidelines for riparian reserves will be implemented.

All temporary road locations, log landings, and tractor or excavator skid trails will be designated to minimize erosion, compaction, and associated sediment yield.

Following completion of project activities less than 15% of the project area will be in an impaired (e.g. compacted, puddled, displaced, or eroded) soil condition

Waterbars will be constructed on roads, skid trails, and landings based on the following guidelines:

% Slope	Waterbar Frequency
10-20	200 feet
20-40	100 feet
40-55	60 feet
55+	30 feet

Erosion prevention and control work shall be completed within 15 calendar days after ground disturbing activities such as skidding and/or yarding operations related to each landing are substantially completed or after designation on the ground of work where such designation is required.

Skid trails, firelines, temporary roads, landings and other displaced areas will be seeded with native grass seed from the appropriate seed zone, or annual ryegrass or cereal grain seed (seed must be tested to be free of all Oregon State noxious weeds) at the rate of 150 to 200 pounds per acre; and mulched with straw of annual or cereal grain species such as annual ryegrass or wheat from certified weed-free fields at the rate of 4000 pounds per acre. Mulch depth should be to a minimum of 6" over all disturbed surfaces.

Temporary Roads will be obliterated, seeded, and mulched.

All equipment operating on National Forest lands will be in good repair and will be free of abnormal leakage of lubricants, fuel, coolants, and hydraulic fluid.

Operators shall take appropriate preventive measures to ensure that any spill of oil, oil products, or other hazardous material does not enter any stream or other waters of the United States or any



of the individual States. In the event of such a contaminant spill the operator will take all reasonable action to contain same.

All contaminated soil, vegetation and debris shall be removed to approved locations off National Forest lands

All in-water work, including temporary fills or structures, shall occur within the Oregon Department of Wildlife's (ODFW) recommended period for in-water work (as specified in the most current version of Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources). Exceptions to these recommended time periods require specific approval from the Corps permit project manager who will consult with ODFW. On tribal lands the Corps will coordinate exceptions to the timing guidelines with the EPA. (For the Sandy River and all upstream tributaries this period is July 15- August 31.)

Nationwide permit activity affecting "waters of the U.S." must not restrict the passage of aquatic life. Activities that require the placement of culverts, diversion structures, or changes to channel morphology must be designed to be consistent with passage standards developed by ODFW and NMFS entitled, ODFW Standards and Criteria for Stream Road Crossings.

The authorized work shall not cause the turbidity of the affected stream or river to exceed 10% above natural turbidity 100 feet downstream of the discharge point. Turbidity shall be monitored frequently during in-water work. Monitoring points shall be 100 feet upstream (representative background) 100 feet downstream, and at the discharge point. A turbidimeter is recommended, however, visual gaging of turbidity is acceptable. Visible turbidity at 100 feet below the discharge would be considered to exceed the standard. The turbidity standard can be exceeded for a maximum of two hours in a 24-hour period provided all practicable erosion control measures have been implemented as applicable, including but not limited to:

- Placing fill in the water that avoids disturbance to the maximum practicable extent (e.g. placing fill with a backhoe rather than end dumping from a truck);
- Preventing constructed fill and related debris from entering the waterway or it's adjacent wetlands by hydroseeding of temporary or permanent disturbances. Additional measures may also be necessary such as filter bags, organic or fabric soil detention systems, leave strips, berms or other measures sufficient to prevent the movement of soil and sediment;
- Using fabric or plastic covers for soil stockpiles that are left idle during rainy seasons;
- Periodic inspections and maintenance of erosion control measures, as necessary, to ensure their continued effectiveness.

Petroleum products, chemicals, fresh cement, construction, or other deleterious waste materials shall not be allowed to enter water or wetlands. Special attention shall be given to preventing sandblasted material and chipped paint from entering these waters.

Only clean fill, free of waste and polluted substances, shall be used when it is authorized as part of the permitted work. (Applies to all Section 404 NWP.)

Dredged and excavated material shall be placed upland and prevented from eroding back into waterways and wetlands (except discharges authorized under NWP #16 for return waters from upland contained disposal sites). Seeding with grass may be required when materials are placed permanently or will not be subject to being moved or reshaped for long periods of time. Materials shall not be placed on unstable slopes, and stockpiles shall not exceed 25 feet in height.

Construction access roads and associated staging areas shall be protected with a gravel blanket or other suitable material to protect against erosion of sediments into waterways and wetlands.

Machinery refueling is to occur off site or in a confined, designated area to prevent spillage into waterways and wetlands.

Where appropriate, bioengineering techniques shall be the preferred method for preventing erosion. ODSL has described many such techniques in Guidelines on Riparian Restoration: Bioengineering which is included in their 2001 Erosion Control General Authorization. Its application includes, but is not limited to, maintaining/improving fish habitat, wildlife corridors, and riparian vegetation buffers.

The Applicant Must Ensure Compliance with the Following Conditions for projects in Water Quality Limited (WQL) Waters and in Stream Segments Designated as Essential Indigenous Salmonid Habitat under State Rules. The Applicant can verify whether the water body falls into these Categories by consulting DEQ for WQL waters, and ODFW for Essential Indigenous Salmonid Habitat.

Notification to DEQ is required prior to performing work in WQL waters.

Notification to ODFW is required prior to performing work in identified Essential Indigenous Salmonid Habitat